



Grade 1 Overview Guide

Online version
and additional resources
available at
www.scholastic.ca/education/nlscience
Password:
Sci1nL2

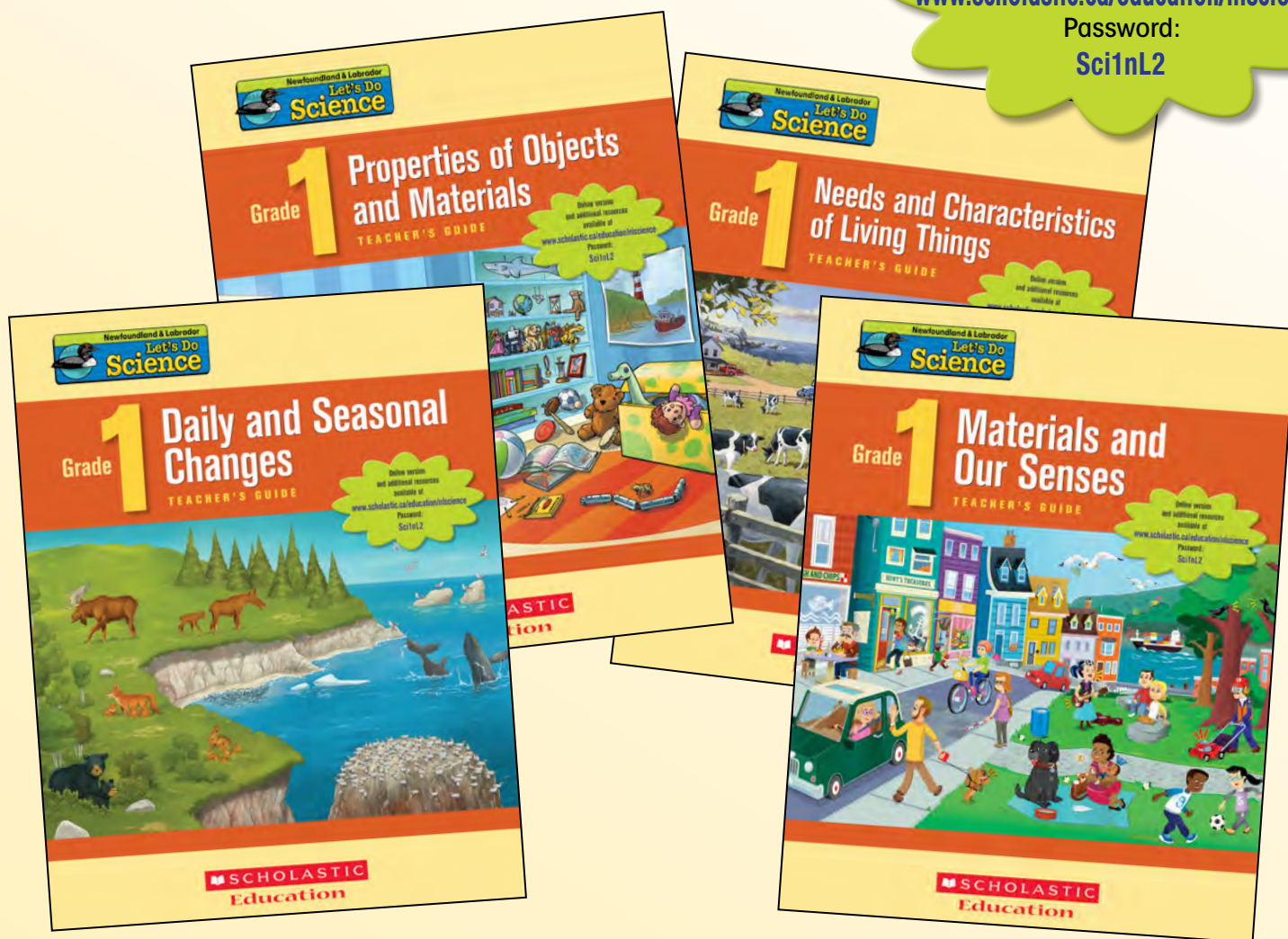




Table of Contents

3	Welcome to <i>Let's Do Science</i> , Grade One
4	<i>Let's Do Science</i> Components
6	How <i>Let's Do Science</i> Supports the Context for Teaching and Learning in Newfoundland and Labrador
10	Science Process Skills
11	The Inquiry and Design Processes
14	Classroom Management
14	Before You Begin the First Unit
16	Classroom Procedures
16	Science Centres
18	Grouping
19	Walk-Through of Teaching Plan Features
23	Assessment Strategies and Tools
25	Science Survey
26	Thinking About This Science Unit
27	My Science Journal
28	How I Worked in My Group
29	How My Group Worked Together
30	Science Research Skills Checklist
31	Science Participation Skills Checklist
32	Attitude Outcomes Assessment

Let's Do Science, Newfoundland and Labrador Grade 1 Overview Guide

Scholastic Canada Ltd. would like to thank the teachers and students at the following schools for their participation with classroom photographs:

Nicole Murphy, Mary Queen of the World Elementary School, Mount Pearl, NL
Rose Brophy, Paradise Elementary, Paradise, NL
Stephanie Collins, Morris Academy, Mount Pearl, NL
Carolyn Wells, A.P. Low Primary, Labrador City, NL

Photos (pages 16–17) by Carolyn Wells

Director of Publishing: Molly Falconer
Project Manager: Jenny Armstrong
Senior Editor: Rachel Albanese
Editors: Jackie Dulson, Sara Goodchild, Sundus Butt
Contributing Editors: Natalia Diaz, Tara Nicholls
Production Editor: Lucia Ferrara
Art Director: Kimberly Kimpton
Designers: Jeff Lucasavitch, Noel Upfield, David Montle
Photo Co-ordinator: Laurie Fekecs
Production Specialist: Pauline Galkowski-Zileff

Copyright ©2016 Scholastic Canada Ltd.
175 Hillmount Road, Markham, Ontario, Canada, L6C 1Z7.

Pages designated as BLMs or reproducibles may be reproduced under license from Access Copyright, or with the express written permission of Scholastic Canada, or as permitted by law. All rights are otherwise reserved, and no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, scanning, recording or otherwise, without the prior written consent of the publisher or a license from The Canadian Copyright Licensing Agency (Access Copyright). For an Access Copyright license, visit www.accesscopyright.ca or call toll free to 1-800-893-5777.

ISBN 978-1-4430-4027-3

Printed in Canada

Welcome to *Let's Do Science*, Grade One

Young students have a natural curiosity and sense of wonder. Nurturing this curiosity in the classroom blends perfectly with science learning that begins with students wondering and asking questions about the world they live in.

Let's Do Science puts an emphasis on actively “doing” science by providing opportunities for students to explore their curiosity in a hands-on learning environment that invites students to ask their own questions and encourages them to discover their own answers. Students also move beyond learning science and the knowledge that comes from asking and answering questions, to being able to use science to learn as they engage in scientific inquiry, performing general explorations and focused investigations, as well as technological problem solving using the design process to develop solutions to practical problems. In this way, students are engaged in ideas and concepts that are relevant and useful to them.

Learning these skills, understanding the science concepts, and developing appropriate attitudes are essential for students to develop scientific literacy—to become good problem solvers and decision makers who know how to ask and answer questions, how to communicate information effectively, how to work collaboratively, and who appreciate the role of science in their lives.

Let's Do Science is a comprehensive set of science resources that provide all the major components necessary for effective science teaching. This makes it easy for you to offer the necessary experiences your students require to explore and investigate their world, and to develop important science process skills such as observing, ordering, predicting, interpreting, and communicating. It supports them as they learn to ask and answer effective questions, think creatively, make decisions, and solve problems more independently.

Let's Do Science Components

Overview Guide

The Overview Guide introduces the *Let's Do Science* components and clarifies how they support the context for teaching and learning specific to Newfoundland and Labrador. The guide also explains important science skills and processes, addresses issues of classroom management and grouping, and provides a walk-through of the features of a grade one teaching plan. Various Assessment BLMs are included.

Science Library and Guide

A collection of 40 fiction and non-fiction titles covering numerous science concepts connected to the unit topics is included. These engaging texts offer reference information and span a range of reading levels, offering support for all of your students through a variety of reading approaches (e.g., Independent Reading and Read Aloud).

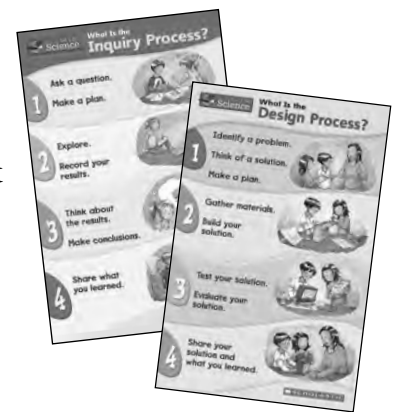
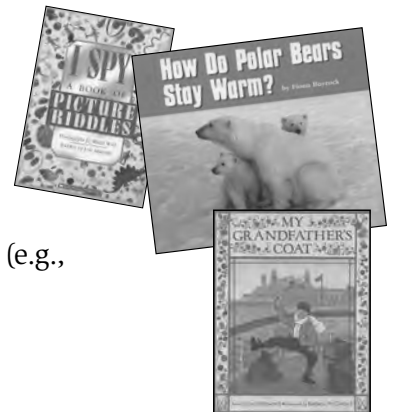
Classroom Posters

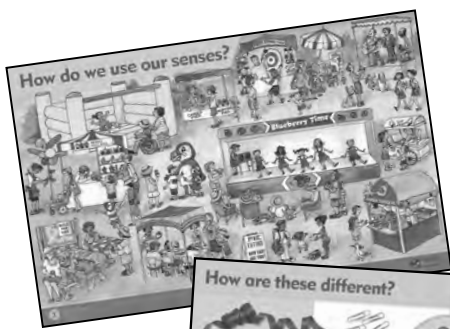
Two classroom posters are included for the grade: *What Is the Inquiry Process?* and *What Is the Design Process?* Each poster outlines the processes in clear, student-friendly language in order to help students to use inquiry to address questions about the nature of things, and to seek answers to practical problems using the design process.

In addition, each *Let's Do Science* unit includes the following components:

Read Aloud Text(s)

Seven Read Aloud texts are included to stimulate learning and to introduce and engage students with science concepts related to each unit. These texts provide focus for addressing a particular science outcome or series of outcomes.





Science Cards

The Science Cards have bright, colourful photographs and illustrations which stimulate and support

students at every level as they work through the units. They also contain limited text per card—one or two key questions that invite students to observe, make connections, analyze, compare, or classify. With your help, grade one students can also use the cards to draw simple conclusions.

Teacher's Guides



The four Teacher's Guides provide everything you need to manage science learning in your classroom including a Planning Guide for each unit; teaching plans; student self-assessment; teacher assessment and rubrics; Additional Resources; and a letter to parents and caregivers. For a walk-through of the teaching plan features, see pages 19–22.



Teacher's Website

Anchor Videos

Each unit incorporates an Anchor Video which is used to introduce students to essential questions about the unit concepts.



Interactive Whiteboard (IWB) Activities

IWB activities provide students with a variety of hands-on learning experiences and the opportunity to apply contextual learning in a supported environment.

Image Bank

A collection of the rights-free images included on the Grade One Science Cards and IWB Activities to be used, for example, by teachers to create new activities and/or by students as a part of presentations.

Find the Teacher's Website at
www.scholastic.ca/education/nlscience
 Password: Sci1nL2





How *Let's Do Science* Supports the Context for Teaching and Learning in Newfoundland and Labrador

Inclusive Education

Let's Do Science helps you meet the needs of an inclusive classroom in a variety of ways.

Valuing Equity and Diversity

A range of resources reflecting the experiences and values of all students is provided in *Let's Do Science* in order for students to consider the many viewpoints and diverse aspects found in their school and community. For example, the interests of all genders are represented through inclusive photographs in the Science Cards and chosen materials for exploration. As well, diverse perspectives are represented, including those of Indigenous peoples through cultural examples in the Science Cards and teaching suggestions in the unit Teacher's Guides.

Differentiated Instruction

Let's Do Science resources fit into a dynamic classroom by providing opportunities for realistic and motivating experiences through a variety of explorations and investigations, including the hands-on manipulation of materials at the Curiosity Centre and in other classroom centre situations.

The highly visual nature of the Science Cards offers students an accessible approach to the various science concepts, no matter the amount of previous knowledge they may have. Blackline Masters and IWB activities also provide ways to access and reinforce simple science concepts.

The directed, guided, and open inquiries outlined in the teaching plans allow students to construct meaning and to connect, collaborate, and communicate with each other in a positive learning community. Further, the open inquiries invite students to make relevant and meaningful choices to enhance their own learning.

The teaching plans in *Let's Do Science* suggest a variety of groupings for activities, including whole class, small group, partners, and individual exploration, allowing students to gain experience in a variety of

instructional groupings. In addition to the variety of collaborative activities, the inclusion of suggested strategies such as using graphic organizers, creating Anchor charts, and using Science Journals and Folders can be effective tools to help in differentiating instruction.

Let's Do Science also makes it easy for you to integrate your students' science learning with what they are learning in other disciplines such as English Language Arts and Mathematics. This integration makes students' learning more connected and therefore more relevant.

Differentiating the Content

The variety of components in *Let's Do Science* allows for the presentation of content through various means, i.e., Read Aloud texts provide opportunities for sharing content through auditory and visual means, while the IWB Activities provide active manipulation, and hands-on explorations and investigations meet the needs of tactile learners.

In addition, the collection of engaging fiction and non-fiction texts included in the Science Library support students of all reading levels as they explore various science concepts and skills.

Differentiating the Process

Where appropriate, the teaching plans in *Let's Do Science* offer suggestions for giving more support or scaffolding for students who need more help, and suggestions for making activities more open for students who are ready to take on more responsibility for their learning.

For new learning to occur, it is important for you to activate students' prior knowledge, correct possible misconceptions, and encourage students to relate new information to prior experiences. Where applicable, the teaching plans note possible misconceptions students may have and offer suggestions to help you address these issues with your students.

The lists of Additional Resources in the Teacher's Guides include non-fiction titles, picture books, and websites for students to enable students to further explore topics of particular interest to them.

Differentiating the Product

Students are given the option of drawing pictures and/or writing a few words when recording their learning on BLMs in the Teacher's Guides.

Using the online version of the Design Process Rubric, you can manipulate the information to co-create criteria for design projects with the students, allowing them to create their own products while meeting the agreed upon required elements.

Differentiating the Learning Environment

The activity suggestions in *Let's Do Science* work well within a differentiated

learning environment. The inclusion of different learning centres that invite collaboration, a mix of static and mobile activities, and the variety of groupings for activities, including whole class, small group, partners, and individual exploration, help to meet the needs of all students engaged in learning.

The colourful illustrations and photographs on the Science Cards reflect the diversity of students' backgrounds, gender, and interests.

Meeting the Needs of Students with Exceptionalities

The variety of resource components and activities in *Let's Do Science* can help you make the accommodations needed to meet the individual learning needs of students with exceptionalities. For example, the Read Aloud texts in each unit can be used to introduce and/or reinforce conceptual learning for students who have impairment in reading; the visual Science Cards, along with the hands-on activities, offer a variety of entry points for all learners into the science concepts; and opportunities to work with partners or small-groups in explorations and investigations can help students who may have difficulty with fine-motor skills while allowing them to have active involvement in the learning.

Meeting the Needs of Students Who Are Highly Able

For students who may already have a vast amount of prior experience and knowledge with a topic, the Science Library titles and Additional Resources referenced in the Teacher's Guides offer opportunities for independent study to increase the depth of exploration in an area of particular interest for students.

Authentic investigation is a prime aspect of the *Let's Do Science* teaching plans, where students are encouraged to base investigations on their own questions and to problem solve based on problems they identify for themselves.

In addition, the Explore More activities in the teaching plans present further opportunities for students who are highly able to delve deeper into concepts.

Gradual Release of Responsibility Teaching Model

Let's Do Science reflects the direct-guided-open continuum of the NL Science 1 curriculum. It incorporates this gradual release of responsibility approach through the flow of activities in each unit and the grade as a whole. For example, in *Unit 1: Daily and Seasonal Changes*, students are introduced to the inquiry process by a teacher walk-through of the What Is the Inquiry Process? poster. The process is then modelled in a directed inquiry, with participation of students as appropriate. Students are then invited to join in following the inquiry process in a mentored/guided learning experience. In this case, the students work in small groups following the process with strong teacher support to investigate an inquiry question. Students are then encouraged to take more control of their learning by conducting open investigations to answer their own questions.

Literacy

Let's Do Science fully supports literacy as the ability to identify, understand, interpret, communicate, compute, and create text, images, and sounds. The activities provided build on, reinforce, and enhance many aspects of the English Language Arts curriculum. Students' communication skills including oral communication, reading, writing, and media literacy skills are vital to communicating their understanding of what they have learned. Purposeful talk enables students to communicate information as well as to explore and understand concepts, identify and solve problems, organize their observations and knowledge, and express their feelings, thoughts, and opinions. It is also important for you to question and prompt students to explain the thinking behind their decisions, solutions, and designs.

Reading in the Content Areas

Let's Do Science connects directly to *Literacy Place in the Early Years* grade one resources for English Language Arts. A variety of Read Aloud, Shared, and Guided texts in different formats are referenced throughout each unit Teacher's Guide.

Learning Skills for Generation Next

The engaging and experiential activities in *Let's Do Science* are infused with learning skills for Generation Next through the inclusion of open-ended questioning, inquiry approaches, self-directed learning, and references to relevant additional resources for students including Internet-based technologies such as websites and videos.

Technology can help students to organize and sort their information, and to write, edit, and present reports on their investigations. Digital cameras and Interactive Whiteboards can be used to communicate multimedia presentations. Computer technology can also be used to connect students to other schools in Newfoundland and Labrador, Canada, or anywhere in the world.

Education for Sustainable Development

Let's Do Science supports education for sustainable development by addressing such necessary skills as being able to analyze consequences of choices, ask questions, and solve problems. Even at a simple level in grade one, students learn an appreciation for the interdependence of all life forms, and the importance of individual responsibility and action in caring for the world around them.

The learning experiences presented in *Let's Do Science* are set in meaningful contexts which allow students to discover the significance of science to their lives and come to appreciate the relationships between science, technology, society, and the environment.

Science Process Skills

The various experiences provided in *Let's Do Science* engage students in learning and practising the important science processes of inquiry and technological design. Both of these processes require the application of one or more of the science process skills.

These skills play an integral part in explorations and investigations related to the inquiry and design processes where students are actively involved in:

- *initiating and planning* (e.g., posing questions, identifying problems to be solved, thinking of a possible solution to a problem, predicting, developing simple plans, selecting appropriate materials)
- *performing and recording* (e.g., following a simple procedure, manipulating materials and tools, making and recording observations and measurements, constructing a prototype)
- *analyzing and interpreting* (e.g., grouping and sequencing materials, interpreting, comparing and evaluating personally-constructed objects, posing answers to initial questions or problems, posing new questions)
- *communicating and teamwork* (communicating while exploring and investigating, using scientific terminology, communicating procedures and results, and responding to ideas and actions of others in constructing their own understanding)

Although students may be carrying out their explorations and investigations in different ways, at some point they will be applying all of the science process skills in context. These include:

- observing—using the senses to gather information first-hand
- grouping/classifying—using observed attributes to sort materials and objects according to a specific sorting rule
- ordering—using observed attributes to organize materials and objects in a sequence
- measuring—using non-standard units of measurement
- inferring—making assumptions about the causes of observed events
- predicting—using prior observations and inferences to forecast what may happen
- investigating/controlling variables—planning an investigation to answer a question or to solve a problem, recognizing that a change in conditions may affect the result, then investigating and gathering the required information
- constructing a prototype—building a prototype device or solution
- interpreting—developing conclusions about information gathered
- evaluating—testing the effectiveness of a device or solution
- making models—constructing realistic representations of living things based on observable characteristics
- communicating (recording and reporting)—recording procedures and results; passing information to, and collecting information from, others through listening, speaking, reading, writing, viewing, and presenting

The Inquiry and Design Processes

For student self-assessment and teacher assessment of the Inquiry Process, see the unit Teacher's Guides.

Inquiry Process

The inquiry process is a way for students to build on their natural curiosity to learn about the world around them. It involves asking questions and developing explanations for natural phenomena. Through the inquiry process, students engage in activities that allow them to develop knowledge and understanding of the two major processes of inquiry—hands-on investigations and research. Both of which provide a means of finding answers to questions.

Asking thoughtful questions is the beginning of any inquiry. This is, however, a challenging task for many students. Young students in particular must work through the process (in a variety of direct, guided, and open investigations) many times before they understand how to answer their own science questions. Repeatedly practising the inquiry process allows students to become increasingly familiar and comfortable with it.

Let's Do Science provides many opportunities for following the inquiry process. Students are encouraged to participate in directed investigations, in guided inquiry where students are given necessary support, and in open investigations where students follow the process to answer their own questions. Students are also given the opportunity to practise researching using a variety of texts (print and digital) to answer questions. A reproducible version of the *What Is the Inquiry Process?* poster (see page 12) is included for students to add to their Science Folders.

Design Process

The design process, also known as technological problem solving, is a means of identifying a problem and creating a practical prototype or solution to resolve it.

Young students may find it difficult to produce workable design solutions or to select appropriate materials to construct their prototypes. A wide range of materials may be provided for students to choose from.

Let's Do Science provides many opportunities for teaching the process and for group and independent practice where students follow the process to create their own solutions to problems they have identified. A reproducible version of the *What Is the Design Process?* poster (see page 13) is included for students to add to their Science Folders.

For student self-assessment and teacher assessment of the Design Process, see the unit 3 and unit 4 Teacher's Guides.

What Is the Inquiry Process?

1

Ask a question.
Make a plan.



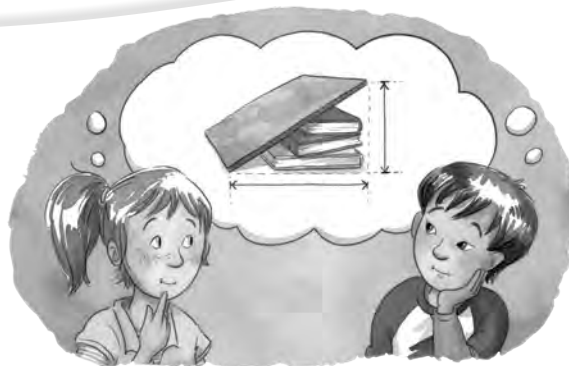
2

Explore.
Record your
results.



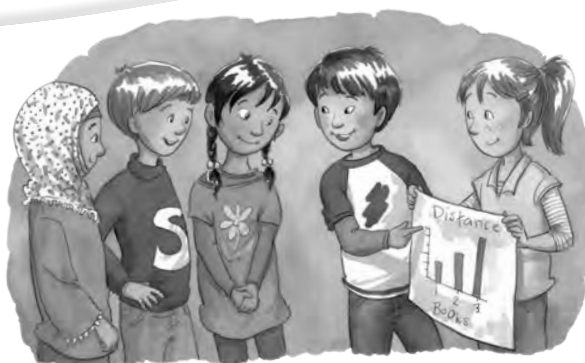
3

Think about
the results.
Make conclusions.



4

Share what
you learned.



What Is the Design Process?

1

Identify a problem.
Think of a solution.
Make a plan.



2

Gather materials.
Build your solution.



3

Test your solution.
Evaluate your solution.



4

Share your solution and what you learned.



Classroom Management



Before You Begin the First Unit

Set Up a Curiosity Centre

This permanent classroom centre gives students an opportunity to investigate science ideas and tools through active participation, free exploration, and independent play. In this hands-on centre, students can touch, feel, and explore



objects related to the science concepts being studied. Check the centre frequently to ensure it is well stocked with items. You may choose to display new relevant items every few days or to introduce items one at a time throughout each unit. See the unit Teacher's Guides for specific suggestions of what to include at the Curiosity Centre for each unit in grade one.

The Science Library and other reference and topic-related books may be made available at the Curiosity Centre if you do not have these displayed in the Reading Centre (see page 15).

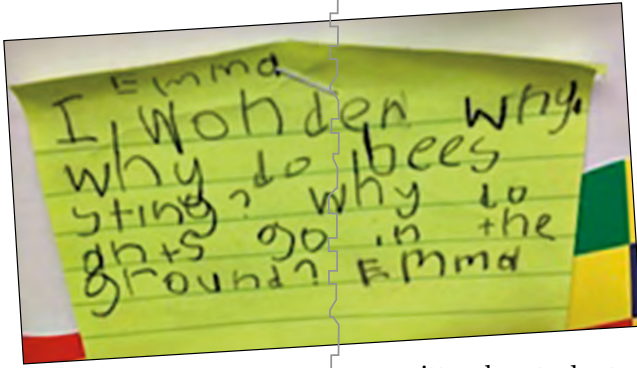
Prepare Science Folders and Journals

Science Folders can be commercial folders or ones made from card stock. They should be big enough to fit the Science Journals and additional papers (BLMs and drawings) that the students want to keep. The folders should be kept in a box or commercial file folder that is easily accessible for students to find their folder. BLMs of the *What is the Design Process?* poster and the *What is the Inquiry Process?* poster are included on pages 12–13 and on the Teacher's Website. Make copies of these BLMs for students to keep in their Science Journals for easy reference. You may wish to have students glue copies of the posters directly onto their journals.

The Science Journals should fit inside the Folders and can be an empty notebook or blank pages stapled together for the students to record their learning and express their thoughts by writing down and/or drawing their observations, questions, ideas, results, notes, and so on.

Science Word Wall

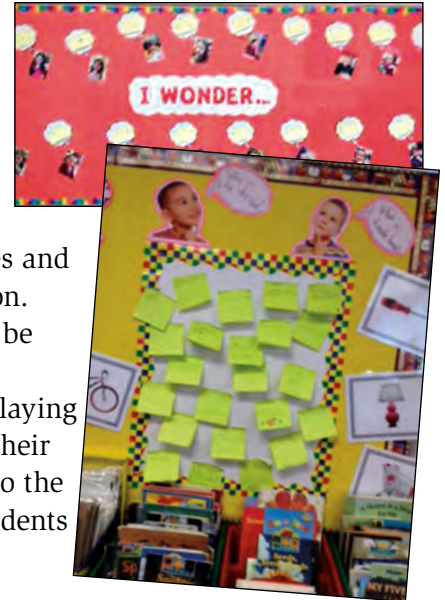
Make space for putting science words on the wall for students to see as they are working. This could be a special section of the regular Word Wall. Or, you could use a specific colour for the science words to save space (i.e., tell students that all words in green, for example, are words from the science explorations and activities). Urge students to use the terms as often as possible as they work through each unit.



I Wonder Wall

Create a space for an I Wonder Wall close to the Curiosity Centre where students' questions can be written on large sticky notes and posted for further discussion.

These questions can either be written by students themselves or ones you have helped them write or have written for them. Displaying questions prominently in the classroom stresses their importance to science inquiry and design. Refer to the I Wonder Wall often and select questions that students may be ready to answer.



Reading Centre

Create a permanent Reading Centre to stimulate discussion and questions. The Science Library titles will help start off a collection of books. See also the Additional Resources section in each unit Teacher's Guide for a list of texts pertaining to the specific concepts being studied in that unit.

A mix of fiction and non-fiction texts can enhance students' interest in and enjoyment of science.

Non-fiction texts should:

- present science concepts accurately
- contain current information
- use scientific terminology that is age-appropriate
- contain a variety of visual features such as captioned photographs, labelled diagrams, charts, and so on



Fiction texts should:

- have a clear science concept or theme running through the story
- contain relevant science terminology
- include illustrations to enhance the text

Classroom Procedures

Establish General Routines and Practices

By organizing appropriate routines and practices early in the school year, you encourage students to take responsibility for their own learning. You may wish to work out with students when and how to:

- set up and clean up equipment and materials at the beginning and end of each activity
- use a quiet signal to indicate that they have a question
- keep track of their own time at Science Centres
- spend free time at the Curiosity Centre if other work is completed early

Establish Routines for Recording and Communicating Learning

Even in grade one, it is essential for students to understand the importance of recording not only their exploration results, but also their questions and reflections. Introduce the purpose and process for Science Journals early in the year (see page 14 for information on preparing Science Folders and Journals), and then provide each student with their own journal. Remind students that questions recorded in their Science Journals could be shared for the I Wonder Wall.

You may also want to establish routines with the students for communicating their learning to small groups or the whole class. Whatever practices you decide to set up, ensure that students understand, for example:

- what kinds of information they should include when recording their work
- where completed work is to be kept (marked bin or boxes are useful)
- when and how work will be handed in



Science Centres

Science centres are generally temporary centres, such as sensory centres, set up on a single table or multiple tables within the classroom. Small groups of students may cycle through the centres or, if students need more assistance with a concept, the explorations could be completed one at a time with the whole group.



A variety of temporary science centres are suggested throughout the *Let's Do Science* units. The use of these centres promotes self-directed learning in students. They provide repeated opportunities for students to explore, problem solve, and work at their own pace to complete the activities. These centres also allow students to work together, share, and develop essential group-work skills. As they manipulate various materials, objects, and tools, students take ownership of their learning and contribute to the learning of others. Questions raised during the activities can be recorded on sticky notes or cards and attached to the I Wonder Wall.

Using a centre approach provides you with opportunities to circulate and ask questions to prompt student thinking. Observational checklists or notes, student self- and peer-assessment, journal entries, and the evaluation of finished products can be used to assess science centre learning.



Grouping

When students work collaboratively, they develop essential group-work skills such as respecting different points of view and appreciating the contributions of others. They also learn to listen, wait their turn, and share while engaging in positive social interactions.

There are many ways that partnerships and small groups can be set up, for example:

- randomly, perhaps by the students themselves
- to meet specific, short-term purposes
- for a shared interest in a particular topic
- to form mixed groups, for example, stronger and weaker students, boys and girls, students with different skills sets, and so on
- to allow students, especially those who are highly able, to delve deeper into concepts

However, the long-term goal for effective group participation should always be to encourage deliberate, effective co-operative learning.

Group Roles

You may wish to establish roles for some group investigations. Depending on your purpose, the size of the group, individual skills and personalities, and the task at hand, you could assign, or invite students to volunteer for, particular roles such as recorder, materials gatherer, and so on. Roles should be rotated over time so that students have a chance to assume and practise all roles and responsibilities.

Students should occasionally be given the opportunity to self-assess how well they worked in their group and to peer-assess how well the group functioned together. (For student self-assessment and peer-assessment of group work, see pages 28–29.)

Walk-Through of Teaching Plan Features

Using the Teaching Plans

As you begin each teaching plan, pre-read the first sections of the plan so you can prepare yourself for the specific curriculum outcomes and requirements. By identifying the outcomes ahead of time, you can work backwards to plan your teaching, and by making sure appropriate materials and equipment are available, you can facilitate student investigations.

Support the students as necessary, using (or adapting) the Activate, Connect, and Consolidate suggestions. See the sample teaching plan which highlights the various features. Please note: Anchor Videos, classroom posters, and links to the Word Wall are included in the teaching plans but are not featured in this sample plan.

- Science Card(s) featured in this teaching plan

- Focus gives a preview of the plan

The sample teaching plan is titled "How Can You Change the Smell and Taste of Food?". It features a central image showing various kitchen items like a bowl, a bottle, and a spoon. Below the image, the text reads: "Focus: Students use their senses to discuss and observe ways the smell and taste of food can be changed." The plan is divided into two main sections: "Specific Curriculum Outcomes" and "Performance Indicators". The "Specific Curriculum Outcomes" section lists three outcomes: 19.0 investigate ways that materials can be changed to alter their smell and taste [GCO 1/3], 20.0 follow a simple procedure [GCO 2], and 1.0 pose questions that lead to exploration and investigation [GCO 2]. The "Performance Indicators" section lists two indicators: use their senses to demonstrate and describe how food can be changed to alter its smell and taste, and make gelatin according to teacher's directions. To the right of these sections is a large box labeled "NOTES:" for teacher use.

- Specific Curriculum Outcomes

- Performance Indicators linked to the Curriculum Outcomes

- space for teacher to record notes

- Cross-Curricular Connections to Math, Social Studies, Art, and/or English Language Arts, as appropriate

- Attitude Outcome Statements

- Getting Organized chart which specifies components, materials needed, advanced planning, and vocabulary that may arise with students

- featured Science Card

- Possible Misconceptions students may hold and suggestions for clarifying these misconceptions with students

- Activate: to activate prior knowledge and introduce concepts

Attitude Outcome Statements

Encourage students to:

- be open-minded in their explorations (GCQ 4)
- work with others in exploring and investigating (GCQ 4)

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- communicate information and ideas effectively and clearly, and to respond personally and critically (GCQ 2)
- use writing and other forms of representation to explore, clarify, and reflect on their thoughts, feelings, experiences, and learning, and to use their imaginations (GCQ 8)

Getting Organized

Program Components	Materials	Before You Begin	Vocabulary
• Science Card 7 • WB Activity 7 • BLM What My Senses Tell Me (p. 16) • BLM Procedural Organizer Literacy Place: Making Ice Cream (Shared Reading—Sequencing Strategy Unit)	• variety of condiments plus apple slices and/or soup samples • students' Science Journals • food or beverage samples • flavoured gelatin powder packages (1 per small group) • cooking utensils for making gelatin • gelatin in a disposable container (1 per student) • plastic spoons (1 per student) • students' Science Folders • lemon juice • sugar • water • small plastic or Styrofoam cups • spoons	• Make enough flavoured gelatin to give each student at least two spoonfuls to taste.	• smell • taste

Safety

- Ensure students are not allergic to apples, flavoured gelatin, or any other food used for tasting.
- Remind students to always wait odours in the nose and sniff.

Science Background

- We use both our tongue and nose to taste food. Our nose detects the odours of foods, and our brain combines the odours with taste sensations to give us a taste experience.

Possible Misconceptions

- When we can't use our nose to help us taste—such as when we have a cold—food seems to have less flavour.
- If students are asked to identify the body parts they use to taste food, most will likely say they use their mouth or tongue. It is very unlikely that students will know that both the tongue and nose work together to create taste sensations. Students can test this by plugging their nose before tasting a food or beverage sample.

ACTIVATE

Silly Changes

Model a situation where you add an unusual ingredient, such as ketchup, to a glass of milk. Ask:

- How might adding the ketchup change the smell of the milk?
- How might it change the taste of the milk?
- What other changes might you notice?

Invite students to suggest other silly ingredients that could be added to the milk to change its smell and/or taste.

Altering Foods

Display Science Card 7. Invite students to look at the images on the card. Discuss any of the materials that may be unfamiliar to students and ask them to identify the materials as sweet, sour, salty, or bitter. Then discuss how the various condiments and spices might change the smell and taste of the apple slices and/or the soup. Provide prompts such as:

- How would the addition of something sour change the smell and taste of the soup?
- What material would you add to the apple slices to make them taste sweeter?
- How much of a material would need to be used to change the smell and taste of a food? How could you find out?
- How else could the food be changed?
- Do you have any questions?

Students' questions can be placed on sticky notes or cards and added to the Wonder Wall.

You might wish to place Science Card 7 at the Curiosity Centre along with some (or all) of the materials shown and invite students to investigate how the materials change the smell and taste of apple slices and/or soup.

- Safety tips, where appropriate

- Science Background to provide usable science information related to content, processes, and skills

- link to the I Wonder Wall

- Interactive Whiteboard Activity

- link to Science Journals

- Connect: to integrate and process the learning

- reproducible BLMs, if required, for conceptual support and recording tools for featured activities

- questions for students—bulleted and highlighted in bold

CONNECT

Sampling Foods

Organize students into pairs and provide each pair with a sample of a food or beverage before and after it has been changed. For example, you might hand out fruit juice before and after dilution with water, instant noodle before and after the addition of boiling water, popcorns before and after grinding, or grapes and raisins (dehydrated grapes). Invite students to smell and taste their samples. Students can record their observations in their Science Journals. Ask:

- How did your first sample smell? How did it taste?
- What did you notice about the second sample? How was it different?
- How was it changed? How do your senses help you to know this?
- Can you think of another way the sample could have been changed?
- Would you need a tool to change the sample?

Making Flavoured Gelatin

Tell the students that they are going to work in small groups to follow a simple procedure to make flavoured gelatin. (Alternatively, you might choose to make instant pudding.) Remind students to look closely at the material in each stage in order to find out how adding water to a food can change its smell and taste. Pause to allow students to describe the smell and taste of the material at various steps in the procedure. Students might also offer descriptions of the appearance and texture at each stage.

1. Organize the students into groups and provide each group with a small amount of gelatin powder. Ask students to think about the following questions as they observe the gelatin powder:
 - What does it look like?
 - What does it smell like?
 - What does it taste like?
 - What does it feel like?
 - What does it sound like when you pour it on a piece of paper?
2. Have students record their observations on BLM *What My Senses Tell Me*. (See page 16.) You may ask students to record only those observations relating to smell and taste or you may ask them to use all five senses to record their observations.
3. Tell students that it's time to add hot water to the powder. Have each group, one at a time, observe what happens to the gelatin after you add hot water to the powder. Invite one of the students to help you stir. Next, add cold water and again have a student help you stir. Ask:
 - What does it look like?
 - What does it smell like?

4. Explain that the next step is to put the gelatin in the fridge to set. Distribute a small amount of the pre-made gelatin to each student. Again, ask students to use their senses to observe the gelatin and to record their observations on BLM *What My Senses Tell Me*. Suggest students use a different coloured pencil for these observations so they can distinguish between their observations of the powder and the set gelatin. You may ask students to record only those observations relating to smell and taste or you may ask them to use all five senses to record their observations. Have students store their completed BLMs in their Science Folders.
5. As a class, discuss how the smell and taste of the gelatin powder changed.
 - How did the gelatin powder smell and taste?
 - What caused the smell and taste of the powder to change?
 - How did it change?
 - What else could you do to change the taste or smell of the gelatin?
 - How might it change if you added fruit before letting the gelatin set in the fridge?
 - Do you have any questions?

Record students' questions on the I Wonder Wall.

Alternatively, students could make juice from frozen concentrate and water, or a fruit drink from flavoured crystals and water. Allow them to smell and taste the materials at various steps in the procedure.

CONSOLIDATE

New Ideas

Ask students to think-pair-share with a partner to develop other potential ways to change a food or beverage to alter its smell and taste. Provide prompts such as:

- What happens to the smell and taste of bread when you toast it?
- How could you change the smell or taste of a glass of water?
- What other foods or drinks could you change?
- How would you make the change?

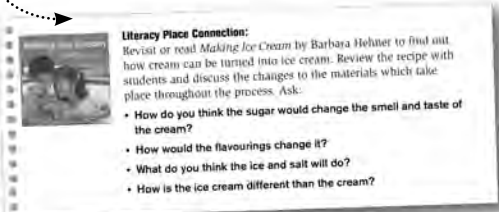
Have students share their ideas with the whole group. With permission, have students demonstrate one or more of the changes.

- link to Science Folders

- Consolidate: to reinforce and consolidate learning

- link to Grade One Literacy Place title

- reproducible BLM



Literacy Place Connection:
Revisit or read *Making Ice Cream* by Barbara Helmer to find out how cream can be turned into ice cream. Review the recipe with students and discuss the changes to the materials which take place throughout the process. Ask:

- How do you think the sugar would change the smell and taste of the cream?
- How would the flavourings change it?
- What do you think the ice and salt will do?
- How is the ice cream different than the cream?

Lemonade Recipe
Review a recipe with the students and ask:

- What do you need to include in a recipe?

Lead students to recognize that you need to list the materials with amounts, plus the steps in the order to follow.

In small groups, invite students to create a recipe for making lemonade using lemon juice, sugar, and water. Provide students with non-standard measuring tools such as small plastic or Styrofoam cups and spoons along with the materials. Ask them to record how much of each material they used. Students can refine their recipe through taste testing. Remind them that if they alter the recipe by adding more of any material, they need to update the measurements for their recipe. Distribute copies of *BLM Procedural Organizer* and have students record their recipes using pictures and words. Students can store their completed BLMs in their Science Folders.

EXPLORE MORE

Talk to an Expert
Invite someone who works in the food industry, such as a cook or a chef, to talk to the class. Have them give a brief talk about ways they can change the smell and taste of food. Provide time for students to ask questions. Students might report what they have learned in the manner of their choosing (e.g., a report, a demonstration, or a poster).

Procedural Organizer

How to _____
by _____

You will need:

1.		
2.		
3.		
4.		

© 2016 Scholastic Canada Ltd. Unit 2: Materials and Our Senses 41

- Explore More: to extend the learning

Assessment Strategies and Tools

Assessment and evaluation are two important parts of a single, ongoing process, a process essential to both teaching and learning. Assessment is the process of collecting information about, and evidence of, students' learning. Evaluation brings meaning to that data and helps teachers determine student's strengths and needs, and guides future instruction.

Assessment strategies are used to have students assess their own knowledge and skills. One helpful assessment strategy is reflection in the form of student self-assessment, peer-assessment, and journal responses.

Assessment tools, such as checklists, are the means teachers use to organize and record information about student learning and achievement. While not actually tools for assessing achievement, inventories of interests and attitudes you get from students can also be helpful in planning or improving individual instruction.

A variety of assessment strategies and tools have been included on pages 25–32. These are suggestions only and may be used in conjunction with other assessment strategies and tools. You can use the samples as they are, if they meet your assessment needs, or as models for creating similar but more appropriate tools of your own.

Science Survey (page 25)

To use this tool with grade one students, you will need to ask the questions orally and record the answers yourself.

Thinking About This Science Unit (page 26)

At the end of each unit, provide students with the opportunity to reflect on their learning.

My Science Journal (page 27)

Encourage students to use this sheet periodically to rate one of their own journal entries.

How I Worked in My Group (page 28)

Students can use this sheet to reflect on their behaviours as members of a small or large group. Provide students with help, if necessary.



How My Group Worked Together (page 29)

Encourage students to use this sheet to reflect on the behaviours of the group as a whole.

Science Research Skills Checklist (page 30)

Use this tool to document information about the student's research behaviours.

Science Participation Skills Checklist (page 31)

This checklist allows you to document student's group-work behaviours and skills.

Attitude Outcomes Assessment (page 32)

Use this tool to document student's attitude development.

Science Survey

Name: _____ **Date:** _____

I think science is _____

I like science because _____

I would like science more if _____

One thing I would like to learn about science is _____

Date: _____

Now I think science is _____

I like science because _____

I would like science more if _____

One thing I learned about science this year is _____

Thinking About This Science Unit

Name: _____ **Date:** _____

The thing I liked the most in this unit was _____

The thing I liked the least in this unit was _____

One skill I did well was _____

One thing I am glad I learned is _____

One thing I still want to learn is _____

My Science Journal

Name: _____ Date: _____

Rating Scale



= Great



= Good



= Needs to
be better

I used words and pictures for my journal entry.			
I recorded what I observed with my senses.			
I recorded my questions.			
I showed my ideas.			
I showed my results.			
I showed what I learned.			

How I Worked in My Group

Name: _____ Date: _____

Rating Scale



= Great



= Good



= Needs to
be better

I participated.			
I shared materials.			
I took turns.			
I listened to others.			
I helped others.			
I shared my ideas.			

How My Group Worked Together

Name: _____ Date: _____

Rating Scale



= Great



= Good



= Needs to
be better

We all participated.			
We shared materials.			
We took turns.			
We listened to each other.			
We helped each other.			
We shared our ideas.			

Science Research Skills Checklist

Rating Scale:

1 = Not evident

2 = With assistance

3 = Mostly independent

4 = Independent

[illegible]

Science Participation Skills Checklist

Rating Scale:

1 = Not evident

2 = With assistance

3 = Mostly independent

4 = Independent

[illegible]

Attitude Outcomes Assessment

Name: _____ Date: _____

Student is able to	Comments
recognize the role and contribution of science in their understanding of the world [GCO 4]	
show interest in and curiosity about objects and events within the immediate environment [GCO 4]	
willingly observe, question, and explore [GCO 4]	
consider their observations and their own ideas when drawing a conclusion [GCO 4]	
appreciate the importance of accuracy [GCO 4]	
be open-minded in their explorations [GCO 4]	
work with others in exploring and investigating [GCO 4]	
be sensitive to the needs of other people, other living things, and the local environment [GCO 4]	
show concern for their safety and that of others in carrying out activities and using materials [GCO 4]	