



Grade 1 Materials and Our Senses

TEACHER'S GUIDE

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



Materials and Our Senses

Table of Contents

- 3 Welcome to the *Materials and Our Senses* Unit
- 6 Planning Guide
- 9 Preparing for the Unit

Individual Teaching Plans

- 10 The Five Senses
- 17 How Do Your Senses Keep You Safe?
- 25 How Can You Describe Materials?
- 31 How Do You Use Your Senses?
- 35 How Can You Change the Smell and Taste of Food?
- 42 How Can You Change the Look and Feel of Materials?
- 49 What Sounds Can Materials Make?

Assessment

- 53 Specific Curriculum Outcomes Checklist
- 54 My Inquiry
- 55 Student Self-Assessment of Inquiry Process
- 56 Teacher Assessment of Inquiry Process
- 57 Inquiry Process Rubric
- 59 Additional Resources
- 60 Letter to Parents and Caregivers

Let's Do Science, Newfoundland and Labrador

Grade 1 Unit 2: Materials and Our Senses Teacher's Guide

Reviewers:

Catherine Phillips, NL

Janice Ryan, NL

Science Consultants:

Ron Ballentine, ON

Nadine Norris, ON

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 978-1-4430-4034-1

Printed in Canada.

10 9 8 7 6 5 4 3 2 1

16 17 18 19 20



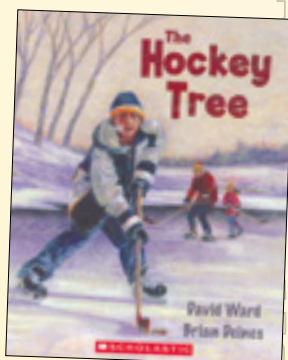
Welcome to the *Materials and Our Senses* Unit

In this unit, students develop their understanding of the five senses and the ways in which we use our senses through a variety of explorations and investigations. Multiple program components will engage students and support learning of the specific science concepts.

Science Cards

This collection of 10 Science Cards will support students' exploration of materials and our senses with each large-format card focusing on a different concept. The bright, colourful photographs and detailed illustrations will engage students and give them multiple opportunities to explore a variety of concepts. These stand-alone cards can also be used at centres to stimulate student explorations. Also, digital versions of these cards are available on the Teacher's Website to be used with an Interactive Whiteboard.

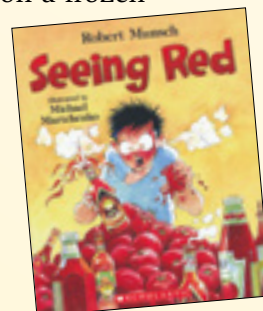




Science Read Alouds

Two Read Aloud texts allow you to introduce and engage students with science concepts. *The Hockey Tree* by David Ward uses descriptive sensory language to evoke a bright, cold day spent playing hockey on a frozen lake. The text also addresses the concept of altering the look and feel of materials by introducing students to “hockey tree pucks.”

Seeing Red by Robert Munsch is a humorous story that shares the activities of two boys as they attempt to change the colour of their hair. This text provides students with an engaging introduction to the inquiry process.



Anchor Video

The Anchor Video: *Materials and Our Senses*, found on the Teacher’s Website, introduces students to essential questions about the five senses and how we use these senses to describe the world around us, notice how materials change, and keep us safe. The video gives a number of examples to activate students’ thinking and to promote questions.

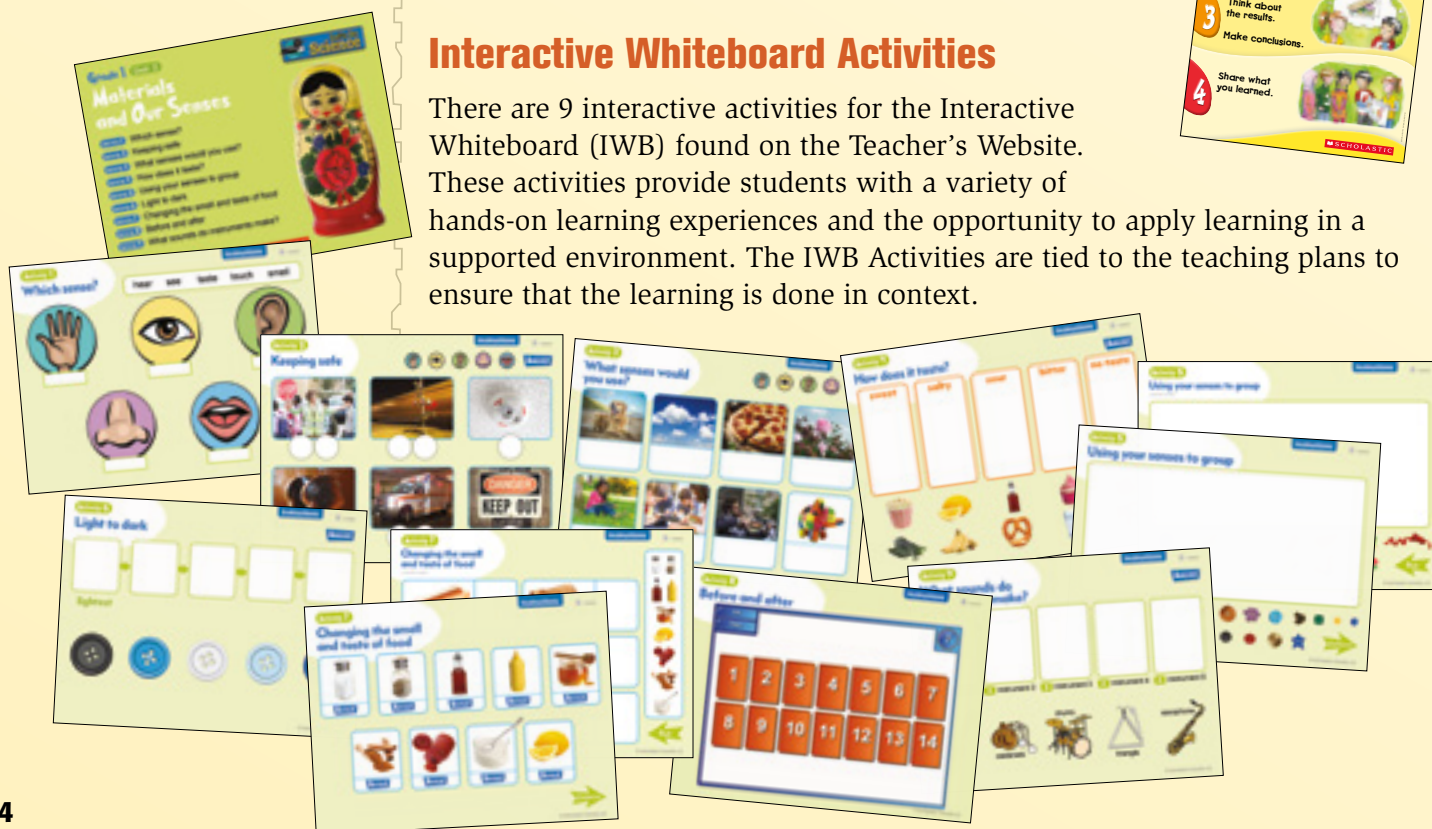
Poster

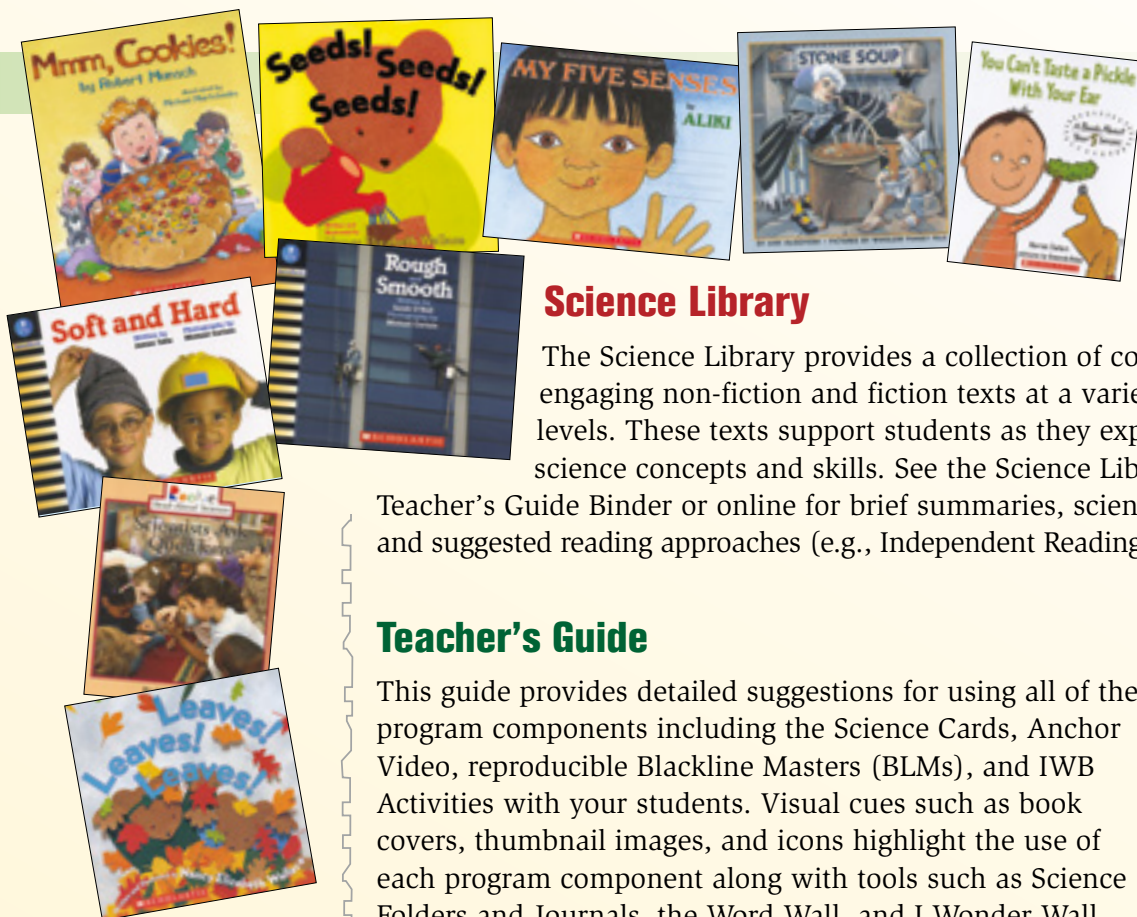
The poster, *What Is the Inquiry Process?* will support students as they follow the steps for guided and open inquiries throughout the unit and learn to question, observe, and explore.



Interactive Whiteboard Activities

There are 9 interactive activities for the Interactive Whiteboard (IWB) found on the Teacher’s Website. These activities provide students with a variety of hands-on learning experiences and the opportunity to apply learning in a supported environment. The IWB Activities are tied to the teaching plans to ensure that the learning is done in context.





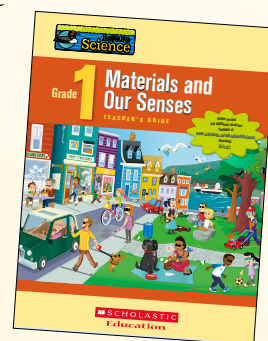
Science Library

The Science Library provides a collection of colourful and engaging non-fiction and fiction texts at a variety of reading levels. These texts support students as they explore various science concepts and skills. See the Science Library Guide in the Teacher's Guide Binder or online for brief summaries, science connections, and suggested reading approaches (e.g., Independent Reading and Read Aloud).

Teacher's Guide

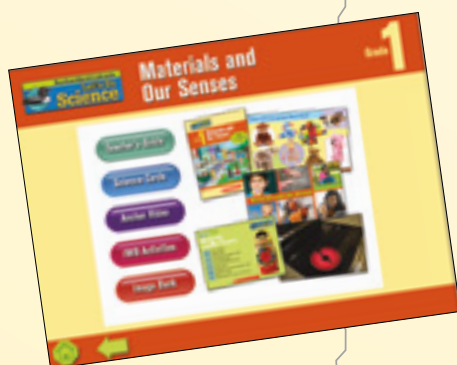
This guide provides detailed suggestions for using all of the program components including the Science Cards, Anchor Video, reproducible Blackline Masters (BLMs), and IWB Activities with your students. Visual cues such as book covers, thumbnail images, and icons highlight the use of each program component along with tools such as Science Folders and Journals, the Word Wall, and I Wonder Wall. Strategies and tools you need to assess students' learning, such as rubrics and checklists, are also included.

Embedded with the teaching plans are connections to Guided, Shared, and Read Aloud texts from *Literacy Place for the Early Years*, Grade 1 that relate to the concepts explored in *Materials and Our Senses*.



Teacher's Website

In addition to the Science Cards, Anchor Video, and IWB Activities mentioned above, the Teacher's Website provides a digital copy of the Teacher's Guide for this unit along with access to an image bank containing the variety of photographic images found on the Science Cards and IWB Activities. These images may be used for teachers to create new IWB Activities or for students to incorporate into presentations. Find the Teacher's Website at scholastic.ca/education/nlscience
Password: Sci1nL2



Planning Guide for *Materials and Our Senses*

Teaching Plans	Specific Curriculum Outcomes	Program Components	Materials	Literacy Place Connections
The Five Senses Students identify the five senses and which body part is used for each sense.	Skills [GCO 2] • 3.0 STSE/K [GCO 1/3] • 16.0	• BLM <i>My Five Senses</i> • IWB Activity 1 • Anchor Video: <i>Materials and Our Senses</i> • Science Card 1 • BLM <i>What My Senses Tell Me</i>	• students' Science Folders • magazines (optional) • sticky notes • two same-sized juice or milk cartons • construction paper	<i>Mmm, Lemon!</i> (Guided Reading, Level G)
How Do Your Senses Keep You Safe? Students explore how they can use their senses to identify materials and discuss various situations in which their senses help to keep them safe.	Skills [GCO 2] • 5.0 • 3.0 • 8.0 STSE/K [GCO 1/3] • 16.0 • 17.0	• Science Card 2 • BLM <i>My Senses Protect Me</i> • IWB Activity 2 • <i>The Hockey Tree</i> (Read Aloud) • Science Card 3 • IWB Activity 3	• digital recording of sounds signalling danger • students' Science Folders • small items inside a bag, box, or sock • variety of scents on cotton balls inside small plastic containers • digitally recorded sounds of materials being manipulated with corresponding pictures of materials • small items in sealed containers (optional) • food and beverage samples • students' Science Journals • fruit samples at differing stages of ripeness • blindfolds, nose plugs, ear plugs or cotton ball, and socks	<i>Rain</i> (Read Aloud—Changes Inquiry Unit)
How Can You Describe Materials? Students use their senses to observe materials and similar objects made from different materials, and compare the attributes.	Skills [GCO 2] • 3.0 STSE/K [GCO 1/3] • 17.0 • 16.0	• Science Card 4 • Science Card 3 • IWB Activity 4 • Science Card 5 • BLM <i>My Favourite Sense</i>	• collection of toy cars • two hula hoops • students' Science Journals • materials with different textures • pitched musical instruments • variety of materials to manipulate to make sounds • variety of materials to describe • descriptive terminology flash cards • students' Science Folders • magazines (optional)	

Teaching Plans	Specific Curriculum Outcomes	Program Components	Materials	Literacy Place Connections
How Do You Use Your Senses? Students use their senses to group and sequence materials according to their attributes. Students will begin to learn some of the attributes of materials such as colour, texture, shape, and size.	Skills [GCO 2] • 9.0 • 18.0	• Science Card 6 • IWB Activity 5 • IWB Activity 6	• stuffed animals or plastic figurines • variety of materials to group and sequence • students' Science Journals • xylophone or water xylophone and wooden spoon	
How Can You Change the Smell and Taste of Food? Students use their senses to discuss and observe ways the smell and taste of food can be changed.	Skills [GCO 2] • 20.0 • 1.0 STSE/K [GCO 1/3] • 19.0	• Science Card 7 • IWB Activity 7 • BLM <i>What My Senses Tell Me</i> • BLM <i>Procedural Organizer</i>	• 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 • set 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	<i>Making Ice Cream</i> (Shared Reading–Sequencing Strategy Unit)

Continued on next page...

Planning Guide for *Materials and Our Senses* (continued)

Teaching Plans	Specific Curriculum Outcomes	Program Components	Materials	Literacy Place Connections
How Can You Change the Look and Feel of Materials? Students manipulate different materials to change their appearance and texture.	Skills [GCO 2] • 1.0 • 22.0 • 13.0 • 5.0 STSE/K [GCO 1/3] • 21.0	• Science Card 8 • IWB Activity 8 • <i>The Hockey Tree</i> (Read Aloud) • <i>Seeing Red</i> (Read Aloud) • <i>What Is the Inquiry Process?</i> poster	• hot-air popcorn popper and popcorn kernels • construction paper • dry tree “rounds” (one per group) • students’ Science Journals • variety of plastic and rubber hockey pucks plus tree “rounds” (dry and wet) • materials whose appearance and texture can be changed such as modelling clay, rough unpainted wood, bananas, bread, artificial nails, marshmallow, soap, soda cracker • tools for changing the appearance and texture of the chosen materials such as scissor, paint, crayons, water, sandpaper • digital camera	
What Sounds Can Materials Make? Students use their senses to recognize sound and manipulate materials to make and alter sounds.	Skills [GCO 2] • 24.0 • 8.0 • 18.0 STSE/K [GCO 1/3] • 23.0	• Science Card 9 • IWB Activity 9 • Science Card 10	• digital recorders • variety of materials that can be used to make sounds (alone or in combination)	

Preparing for the Unit

1. Curiosity Centre

The Curiosity 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 explore objects related to materials and our senses.

The Curiosity Centre could have

- a variety of items for students to explore with their senses (except taste, which should be done under adult supervision) such as shells; feathers; buttons; ribbon; sequins; yarn; paper clips; marbles; metal washers; seeds or beans; crayons; plastic bottles; elastics; aluminum pie plates; paper; pencils; rulers; balloons; wool, aluminum foil, sandpaper; pipe cleaners; craft sticks; combs; straws; paper rolls; swatches of cloth with differing textures; paint swatches
- a variety of photographs from magazines of the body parts associated with each sense (eyes, ears, nose, tongue/nose, and skin) for students to examine and use a resource for drawing

Check the centre frequently to ensure it is well stocked with items. Invite students to contribute to the centre by bringing in items or photographs related to materials and our senses. Remind students to tidy up the materials when they are finished.

Note: You may choose to display new items every few days or introduce items one at a time throughout the unit.

2. Prepare Science Journals and Folders



Check that students are recording appropriately in their Science Journals, ensuring that they date each entry and record ideas using sketches with labels, lists of words, or sentences. Continue to encourage them to add new questions or ideas to their Journals as often as they like.

Remind students that they should store completed BLMs, drawings, stories, etc. that are related to the *Materials and Our Senses* unit in their Science Folders.

3. Word Wall



Add any relevant science terminology to the Word Wall throughout the unit. Urge students to use the terms as often as possible as they work through the unit.

4. I Wonder Wall



Build the I Wonder Wall throughout the unit by posting students' questions as they arise. Refer to the I Wonder Wall often and select questions that students may be ready to answer.

5. Reading Centre

Add texts (books, magazines, and photographs) relating to the senses and how we use them to the Reading Centre. The titles in the Science library will help start off a collection of books. Also refer to the lists of non-fiction texts in the Additional Resources section of this guide (page 59).

The Five Senses



Focus: Students identify the five senses and which body part is used for each sense.

Specific Curriculum Outcomes

Students will be expected to:

- 16.0 explore how each of the senses help us recognize and safely use materials [GCO 1/3]
- 3.0 communicate using scientific terminology [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- identify the five senses and accompanying body parts
- use their senses to describe the world around them

NOTES:

Attitude Outcome Statements

Encourage students to:

- 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 their immediate environment [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- speak and listen to explore, extend, clarify, and reflect on their thoughts, ideas, feelings, and experiences [GCO 1]
- select, read, and view with understanding a range of literature, information, media, and visual text [GCO 4]

Getting Organized

Program Components	Materials	Before You Begin	Vocabulary
• BLM <i>My Five Senses</i> • IWB Activity 1 • Anchor Video: <i>Materials and Our Senses</i> • Science Card 1 • BLM <i>What My Senses Tell Me</i> Literacy Place: • <i>Mmm, Lemon!</i> (Guided Reading, Level G)	• students' Science Folders • magazines (optional) • sticky notes • two same-sized juice or milk cartons • construction paper	• Create a senses cube by cutting the bottom off of two same-sized juice or milk cartons and pushing them together to make a cube. Cover in construction paper.	• hear • see • senses • smell • taste • touch

Safety

- Review school safety rules before students go outside for an investigation.

Science Background

- Our five senses (seeing, hearing, smelling, tasting, and touching) help us learn many things about the world in which we live. Each sense is related to a specific body part or sense organ (eyes, ears, nose, tongue/nose, and skin) but they can be used together to take in sights, sounds, smells, tastes, and touch sensations all at once.
- Our eyes allow us to see. The pupil lets in light which hits a part inside at the back of the eye called the retina. When this light hits the retina, it takes an upside-down image of whatever we're looking at and sends it to the

brain along the optic nerve. Our brain makes sense of the image by turning it right side up very quickly.

- Sound is caused when objects vibrate. These vibrations create sound waves that travel through the air, water, and other materials. When sound waves reach our ears, they hit the eardrum and make it vibrate. The tiny vibrations move through the inner ear and are translated into sounds that are sent to the brain through the auditory nerve.
- Our nose lets us smell. The inside of the nose is lined with mucous membranes. These membranes have smell receptors that are connected to the olfactory nerve. When we smell something, the smell receptors react and send a message to the brain.
- Taste buds are the tiny bumps all over our tongue and the roof of our mouth. Taste buds are connected to nerves in the tongue, and they pick up the signals that are sent to the brain to tell us what we are tasting. The tongue also picks up texture and temperature in food so we can distinguish creamy, crunchy, hot, or dry. Our nose also plays a part in tasting. As food is chewed, air flows from the mouth to the back of the throat and some of this air reaches the back of the nose. The nose picks up the smell, and the signals are sent to the brain so we can taste what we're chewing.
- We can touch what we come in contact with because we have tiny receptors all over our skin that are connected to nerve endings which send information to the brain. While we have these receptors everywhere, the greatest number of receptors are in our fingertips.

ACTIVATE

IWB Activity:

- Challenge students to match the body part with each of the senses using Activity 1: *Which sense?* (see the Teacher's Website).



My Five Senses

Write the words for each sense in the boxes. Draw something you can observe with each sense.

taste touch smell sight taste



Guess the Sense

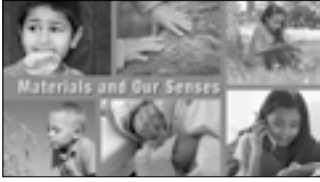
Mime some sensory experiences such as smelling something foul, seeing something at a distance, touching something hot, hearing something loud, or tasting something awful. Invite students to identify what you are doing and what sense and related body part is being used each time. Ask:

- What am I doing?
- What sense and body part am I using?

Have students name the five senses then add the words “senses,” “hear,” “see,” “smell,” “taste,” and “touch” to the Word Wall.

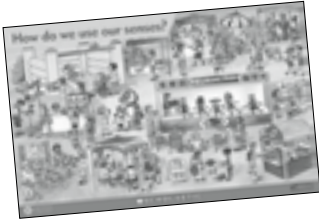
Distribute copies of BLM *My Five Senses*. Students record the sense associated with each body part in the drawing of the child, then draw one thing they can observe with each sense. If students prefer, they could cut out pictures from magazines that show people using each of the five senses and glue them to their sheet. Discuss students' drawings as a whole group. Have students store their completed BLMs in their Science Folders.

Anchor Video



Play the Anchor Video: *Materials and Our Senses* which is located on the Teacher's Website. Set a focus for viewing by asking students to think about their senses and how they use them. You may choose to pause the video to allow students to answer questions or to discuss any questions which students may have.

CONNECT



Using the Senses

Have students examine Science Card 1. Display the illustration and ask students to identify what they could see, feel, hear, smell, and taste if they were in the scene. Have them identify which body part they use for each sense. You might choose to list the activities on a chart under each sense.

Ask:

- What can you see? Which body part are you using?
- What can you feel? Which body part are you using?
- What can you hear? Which body part are you using?
- What can you smell? Which body part are you using?
- What can you taste? Which body parts are you using?

Discussing Senses

Invite students to talk with a partner and share ways in which they use their senses throughout the day. Provide prompts such as:

- How do you use your senses when you get ready for school?
- How do you use your senses in class?
- Which senses do you use during lunchtime?
- What questions do you have?



Invite a few pairs to share their ideas with the whole group. Record questions on sticky notes and attach them to the I Wonder Wall.

Literacy Place Connection:

The media text *Mmm, Lemon!* (Guided Reading, Level G) is a persuasive brochure that promotes the taste of lemon. Discuss with students how the brochure appeals to their senses.



Senses Cube

Create a cube by cutting the bottom off of two same-sized juice or milk cartons and pushing them together to make a cube (or, you may use a large cube or die from the classroom). Cover the cube with construction paper and illustrate or glue an image onto each side to represent the senses (eyes, ear, nose, mouth, and hand). Print “Roll again.” on the sixth side of the cube.

Each student can take a turn rolling the senses cube and describing how he or she uses that sense to find information and learn things about the world around them.

CONSOLIDATE

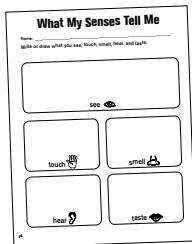
Neighbourhood Walk

If the weather is fine, take students on a neighbourhood walk or walk through the school and have students identify what they can see, feel, hear, and smell. Tell students not to taste anything on the walk without permission. Ask questions during the walk, such as:

- **Do you smell anything? What do you think it is?**
- **What sounds do you hear? What do you think is making those sounds?**
- **Do you see any people or animals? What are they doing?**
- **What can you feel? Is anything smooth or rough?**
- **What body parts are you using to get this information?**

Encourage students to share their experiences with each other in order to help them remember everything they can about what they are sensing.

Provide a copy of BLM *What My Senses Tell Me* for each student and have them fill in the BLM by writing or drawing something they identified for each sense during their walk (except for taste, unless permission was given). Invite students to share their observations with a partner. Have students store their completed BLMs in their Science Folders.



EXPLORE MORE

Senses Story

Display Science Card 1 at the writing centre and invite students to create a story describing how they used all of their senses at the blueberry festival. You may wish to have a classroom volunteer scribe the story for students who need assistance.

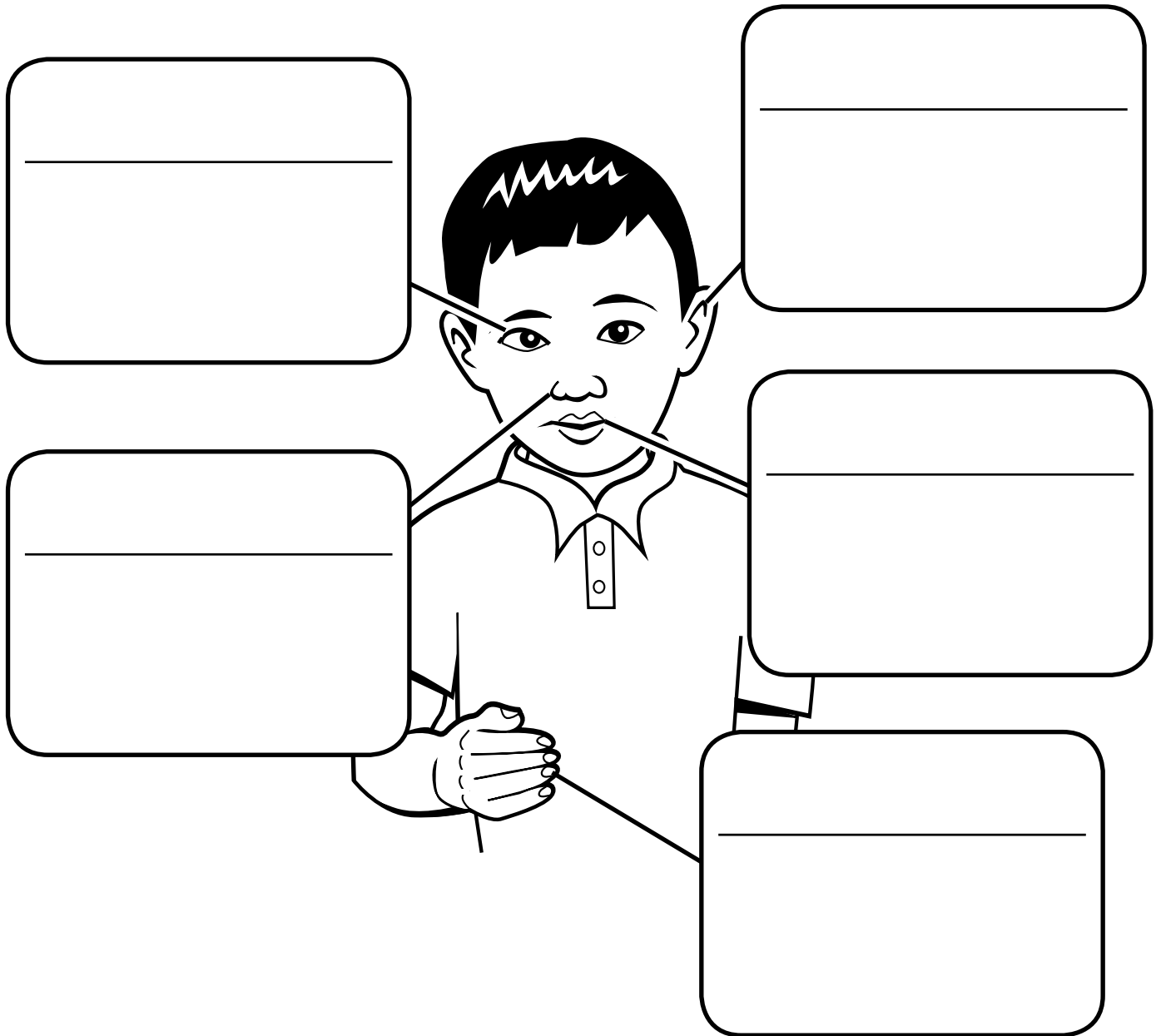


My Five Senses

Name: _____

Write the sense for each body part.

Draw something you can observe with each sense.



taste

touch

smell

hear

see

What My Senses Tell Me

Name: _____

Write or draw what you see, touch, smell, hear, and taste.

see



touch



smell



hear



taste



How Do Your Senses Keep You Safe?



Focus: Students explore how they can use their senses to identify materials and discuss various situations in which their senses help to keep them safe.

Specific Curriculum Outcomes

Students will be expected to:

- 16.0 explore how each of the senses helps us recognize and safely use materials [GCO 1/3]
- 5.0 follow safety procedures and rules [GCO 2]
- 17.0 explore attributes of materials we can learn to recognize through each of our senses [GCO 1/3]
- 3.0 communicate using scientific terminology [GCO 2]
- 8.0 communicate while exploring and investigating [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- recognize how their senses help to keep them safe from dangers
- identify materials using their five senses
- demonstrate how their senses help them, for example, by choosing appropriately ripe fruit to eat

NOTES:

Attitude Outcome Statements

Encourage students to:

- show concern for their safety and that of others in carrying out activities and using materials [GCO 4]
- willingly observe, question, and explore [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- respond personally to a range of texts [GCO 6]
- interact with sensitivity and respect, considering the situation, audience, and purpose [GCO 3]

Getting Organized

Program Components	Materials	Before You Begin	Vocabulary
• Science Card 2 • BLM <i>My Senses Protect Me</i> • IWB Activity 2 • <i>The Hockey Tree</i> (Read Aloud) • Science Card 3 • IWB Activity 3 Literacy Place: <i>Rain</i> (Read Aloud—Changes Inquiry Unit)	• digital recording of sounds signalling danger • students' Science Folders • small items inside a bag, box, or sock • variety of scents on cotton balls inside small plastic containers • digitally recorded sounds of materials being manipulated with corresponding pictures of materials • small items in sealed containers (optional) • food and beverage samples • students' Science Journals • fruit samples at differing stages of ripeness • blindfolds, nose plugs, ear plugs or cotton balls, and socks • Lego bricks • pieces of peeled apple and pear • small items in sealed containers	• Prepare five sensory centres with a variety of materials for students to touch, smell, hear, see, and taste (if appropriate). • Compile a digital recording of sounds signalling danger. Sound clips can be found on the Internet. • Gather samples of fruit at different stages of ripeness. Ensure that some samples will be appropriate to taste. • Gather blindfolds, nose plugs, ear plugs or cotton balls, and socks for students to use when exploring what it would be like to live without all of their senses.	• attribute • material

Safety

- Ensure students are not allergic to any foods or scents used for testing. Discuss safety procedures before beginning any investigations.

Science Background

- Our five senses help us to explore the world around us.
- Our senses also protect us by warning of dangers in our surroundings. Information gathered by the sense organs is sent along nerves to the brain. The brain then sends messages to the body telling it how to respond.
- Not everyone is born with five senses but people who are born blind or unable to hear may learn to use the senses they have better than people born with all five senses.
- Technologies are being developed that can replace information from a missing sense by using input from a different sense. For example, devices for people with visual impairments can translate visual images into bursts of music or sound which people learn to decode in order to 'see.'
- Another device uses a vibrating vest to allow people with deafness or severe hearing impairments to perceive auditory information through small vibrations on their torso.

Possible Misconceptions

- Students may think that people with disabilities can't recognize objects. Explain that someone lacking one sense can use another sense to recognize a material or object. For example, a visually impaired person can recognize objects by touch instead of sight.

ACTIVATE



- **IWB Activity:**
- Students can use
- Activity 2: *Keeping safe* to match the
- senses that keep them
- safe to the dangerous
- situations shown (see
- the Teacher's Website).
-
-



Senses and Safety

Display Science Card 2 and invite students to look at the photos and identify the dangerous items. Ask students how their senses can help to keep them safe from these dangers. Provide prompts such as:

- How can you tell if foods/beverages are too hot, too salty, or if they have soured or spoiled?
- How can you tell if an emergency vehicle is approaching?
- How can you tell if materials are hot, sharp, or slippery?
- What other dangers might have been included on the card?

You might provide a digital recording of sounds signalling danger, such as a fire alarm, a police siren, or a shout for help. Ask:

- How does our sense of hearing help to keep us safe?



Distribute copies of BLM *My Senses Protect Me* and challenge students to identify the senses that help to keep them safe from the dangers in each situation.

Role Play

Divide the class into small groups and invite students to role play scenarios where their senses helped them to keep safe.

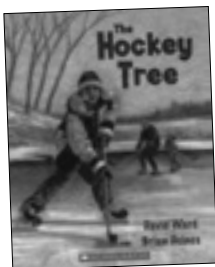
Discuss Safety Procedures

As a class, discuss safety procedures students should follow during the course of the unit to protect their senses while conducting science investigations. Possible rules and procedures include wearing safety goggles, no tasting unless given permission to do so, washing hands after handling materials and tools, and never smelling an unknown substance directly (always waft odours to the nose and sniff). These rules could be recorded on a chart and posted for students to use throughout the unit. Some students may like to draw pictures to accompany the rules.

CONNECT

Read Aloud: *The Hockey Tree*

Before Reading



Remind students of how we use our senses to learn about the world around us. Discuss how we use descriptive language to express what our senses tell us.

Introduce *The Hockey Tree*. Tell students that as you read the text aloud, they are going to listen for the sensory language in the text that tell us what the characters see, hear, smell, and touch with their senses. Explain that they should be ready to identify which sense is being used.

Show students the cover of *The Hockey Tree* and ask:

- **What season do you think this is?**
- **What might you see, feel, hear, and smell, if you were in the scene?**

During Reading

As you turn to each new page, read the text and clarify any new vocabulary or concepts. Then, if appropriate, ask students to point out any sensory language they hear and to identify which sense is being used, for example:

Page 6:

- “Owen and Holly crunched through the snow....” (hear)
- “Their breath formed small, puffy clouds in the cold air.” (see)
- “Dad helped with their skates, his fingers tugging on the long laces.” (touch)

Page 8:

- “The puck smacked the ice.” (see, hear)

Page 12:

- “It [the puck] slid straight toward a fishing hole and disappeared with a small splash.” (see, hear)

Page 15:

- “The trees were heavy with fresh snow.” (see)
- “Owen could smell the scent of pine and poplar as he pushed the branches aside.” (smell)

Page 17:

- “Dad gave it a gentle nudge with his foot. ‘Not this one,’ he said. ‘See how soft it is? This trunk is rotten.’” (touch, see)

Page 18:

- “Owen could smell the fresh wood.” (smell)

Page 23:

- He brought his stick way back and cracked the puck.” (hear)

Page 27:

- “By early afternoon a bright winter sun was turning the ice into a blazing sheet of white.” (see)
- “Shouts and laughter drifted across the lake....” (hear)

Page 28:

- “He watched the poplar trees blur past his window and smiled.” (see)

After Reading

Discuss with students how sensory language helps us to understand what the senses can tell us. Provide prompts such as:

- **How do our senses help us to recognize and identify materials?**
- **How did the sensory descriptions help us to imagine what the characters were seeing, touching, smelling, and hearing?**

Sensory Centres

Set up mini sensory centres for each of the five senses to enable students to explore and identify materials using their senses. Small groups of students can cycle through the centres or, if students need more assistance, the explorations could be completed for one sense at a time with the whole group.

Labels may be provided at the centres to aid with identification. Students can match the labels to numbered materials.

Touch – Provide a variety of mystery materials placed inside a bag, box, or sock. Students place their hand inside the bag and use only the sense of touch to describe and identify the materials.

Smell – Add various scents (e.g., vinegar, cinnamon, vanilla, lemon, pickling juice, etc.) to cotton balls and place them inside small plastic containers. Students open the container, waft the odour to their nose, and gently sniff the air in order to describe and identify the scents.

Hear – Digitally record the sounds of a variety of materials (e.g., a bouncing rubber ball, crumpling paper, popping popcorn, water dripping from a faucet, a flag flapping in the wind, etc.). Students listen to the sounds in order to describe and identify the materials. Provide pictures of the corresponding objects for students to match with the sounds. They could place a marker on the picture as each sound is identified. Students could then sort the pictures by soft (i.e., quiet) and loud sounds.

Alternatively, you could prepare several sealed containers holding one material or a combination of several different materials. Students shake the containers and describe the sounds they hear. Students record a prediction of what is inside and then open the containers to check.

See – Place various materials at the centre. Without touching the items, students can describe and identify what they see.

Taste – Provide a variety of small food and beverage samples (e.g., yogurt, jelly beans, fruit juice, flavoured water, etc.). Students observe and taste the samples in order to describe and identify the flavours.

While students are exploring with materials at the sensory centres, encourage them to think about questions they have about the materials. These questions can be recorded on sticky notes or cards and attached to the I Wonder Wall.

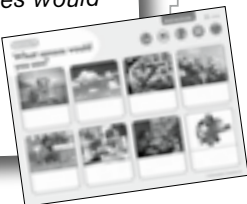


CONSOLIDATE



IWB Activity:

- Have students identify
- and explain which
- senses they can use
- with each item shown
- using Activity 3:
- *What senses would*
- *you use?*
- (see the
- Teacher's
- Website).

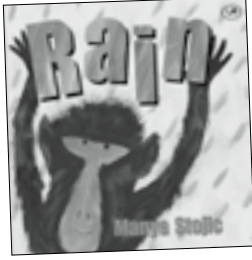


Attributes of Materials

Display Science Card 3. Invite students to identify and describe the materials shown on the card. You may also provide samples of the objects shown to allow students to explore physical sensory learning objects. Students can record the attributes in their Science Journals. Explain the term “attribute” and add this word to the Word Wall. You might provide sentence starters such as “This is a _____. It is _____. Remind students that even if a material does not have a specific observable attribute, it can still be described. For example, a glass has no colour so it is colourless; and water is tasteless and odourless.

Food Safety

Bring in a variety fruit samples at differing stages of ripeness. Have students use all of their senses to describe the fruit samples and to select the most appropriate sample to eat.

**Literacy Place Connection:**

Revisit or read *Rain* by Manya Stojic in which various African animals describe how they know that the rain has come to their dry land. Discuss with students how the animals use their senses. Ask:

- How do their senses help the animals to know the rain has come?
- What senses do the animals use to enjoy their world after the rain stops?

EXPLORE MORE

Loss of a Sense

Help students to realize what it would be like to live without all of their senses by organizing them in groups of four and having each group member simulate the loss of one sense (using a blindfold, nose plug, ear plugs or cotton balls, and putting socks on their hands). Give students several tasks to do such as:

- building a Lego structure (difficult without senses of sight and touch)
- identifying pieces of peeled fruit as apple or pear (difficult without sense of smell)
- identifying objects in sealed containers (difficult without sense of hearing)

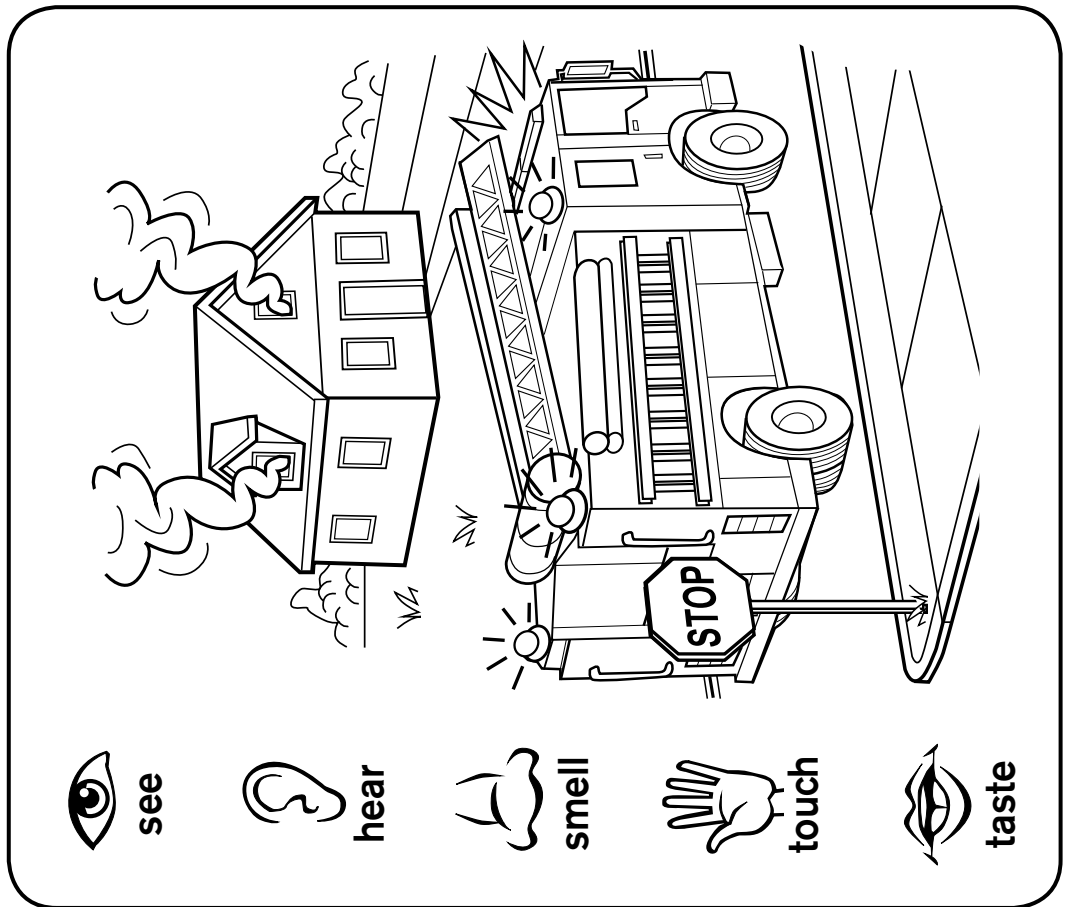
Then, as a whole group, discuss how the loss of a sense made the task difficult.

Invite students to discuss which sense they think it would be hardest to live without and why they think so. Have students do a think-pair-share with a partner before holding a whole-group discussion.

My Senses Protect Me

Name: _____

Circle the senses that keep you safe from each danger.



see



hear



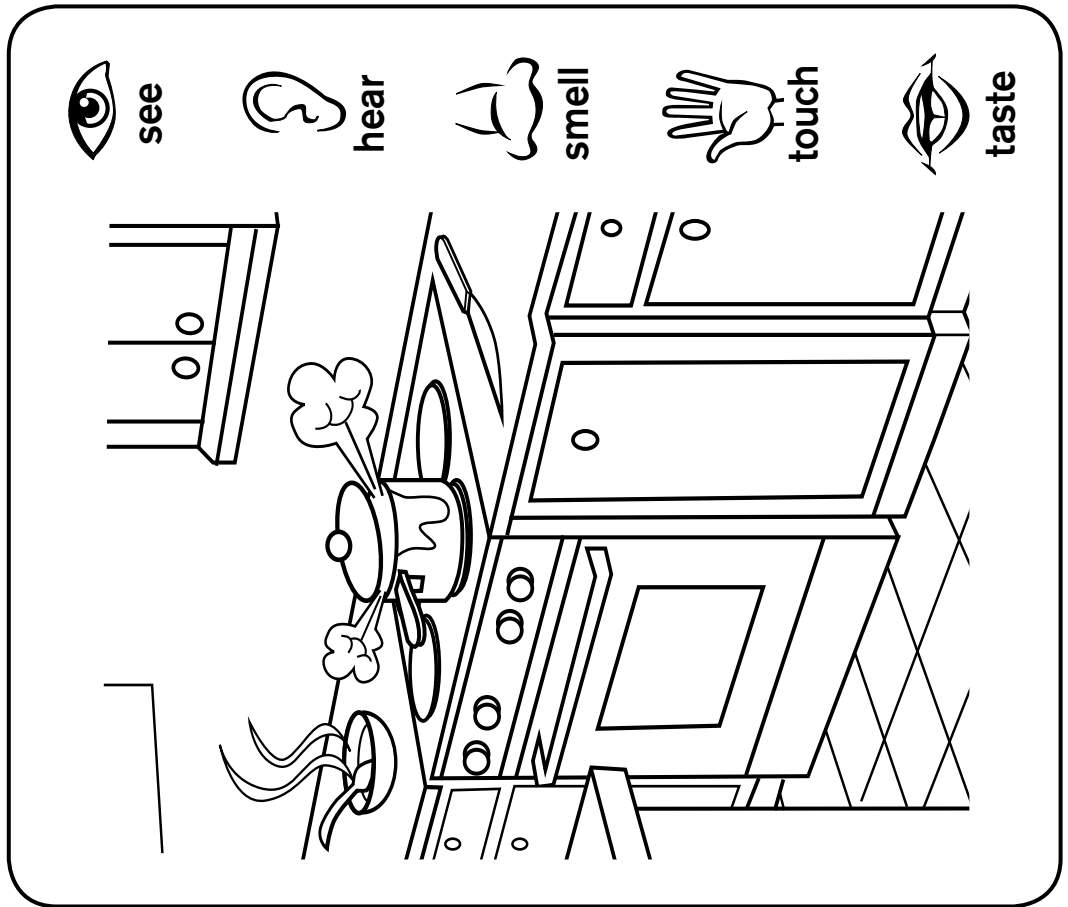
smell



touch



taste



see



hear



smell

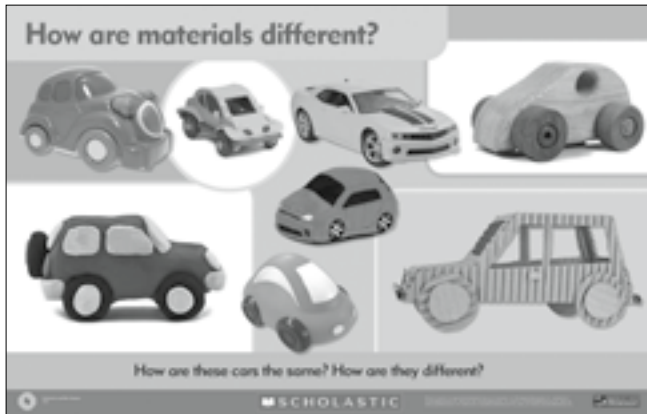


touch



taste

How Can You Describe Materials?



Focus: Students use their senses to observe materials and similar objects made from different materials, and compare the attributes.

Specific Curriculum Outcomes

Students will be expected to:

- 17.0 explore attributes of materials we can learn to recognize through each of our senses [GCO 1/3]
- 3.0 communicate using scientific terminology [GCO 2]
- 16.0 explore how each of the senses helps us recognize and safely use materials [GCO 1/3]

Performance Indicators

Students will be expected to:

- use their senses to identify and compare materials according to the materials' attributes
- use accurate descriptive terminology to describe a variety of materials

NOTES:

Attitude Outcome Statements

Encourage students to:

- willingly observe, question, and explore [GCO 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 [GCO 2]

Getting Organized

Program Components	Materials	Before You Begin	Vocabulary
• Science Card 4 • Science Card 3 • IWB Activity 4 • Science Card 5 • BLM <i>My Favourite Sense</i>	• collection of toy cars • two hula hoops • students' Science Journals • materials with different textures • pitched musical instruments • variety of materials to manipulate to make sounds • variety of materials to describe • descriptive terminology flash cards • students' Science Folders • magazines (optional)	• Create descriptive terminology flash cards (be sure to include "tasteless," "odourless," "colourless," and "should not be tasted").	• lustre • shape • texture • bitter • salty • sour • sweet

Safety

- Ensure students are not allergic to any food used for tasting.

Science Background

- The taste buds on the tongue pick up four distinct taste sensations: sweet, sour, salty, and bitter. Everything we taste is a specific combination of these four flavours.

ACTIVATE



Identifying Attributes

Display Science Card 4 and have students identify attributes of the toy cars shown, e.g., colour, size, shape, lustre, and texture. You might also provide a collection of actual toy cars for students to examine. Ask parents to send in some toy cars at the beginning of the unit. Provide prompts such as:

- How does the car look?
- How does it feel?
- What is its shape?



- How big is it? How small is it?
- Is it shiny or dull?
- How are the cars the same? How are they different?

Set out two large hula hoops and invite students to sort the collection of toy cars according to various attributes they choose. Have students record the information in their Science Journals.

Descriptive Words

Create an Anchor Chart for the senses on the IWB or on chart paper and record students' descriptive terminology beginning with appearance (see) and texture (touch). Examples might include:

Senses				
See	Touch	Smell	Hear	Taste
bright, dark, dull, dim, clear, round colour words (blue, red, orange, etc.)	smooth, flat, hard, wet, moist, damp, dry, crisp, firm, flabby, gummy, sticky, woolly, spongy, velvety, furry, silky, soft, cold, cool, chilly, hot, warm, sleek, slippery, slimy, greasy, oily, rough, bumpy, jagged, pointed, sharp	stinky, foul, pleasant, sweet, fruity, perfume, floral, pungent, aromatic, putrid, musky, unpleasant, strong, weak, fresh, sharp	loud, soft, quiet, noisy, click, crunch, scratch, tap, honk	sweet, salty, sour, bitter, spicy, yucky, yummy

CONNECT

Texture Book

Provide a variety of materials with different textures and invite students to describe the materials using their senses. Add the descriptive terminology to the class Anchor Chart. Students can create a class "Texture Book" in which they tape or glue a different material on each page. Students label each page (e.g., rough, hard, bumpy, soft, smooth, scratchy, furry, etc.), using the Anchor Chart for reference.

Describing Sounds

Use pitched musical instruments such as a keyboard, guitar, xylophone, etc. to play sounds for students. Ask:

- Is the sound loud or soft (i.e., quiet)?
- Is it high-pitched or low-pitched? How do you know?

Provide small groups of students with various materials and invite them to manipulate the materials to make sounds. When the students have finished investigating in their groups, hold a whole-group discussion and ask students to describe the sounds the materials made (e.g., click, crunch, honk, scratch, tap, etc.). Continue to add descriptive terminology to the Anchor Chart.



IWB Activity:

- Invite students to use Activity 4: *How does it taste?* to organize a set of foods by taste (see the Teacher's Website).

 A worksheet titled "How does it taste?" with four columns for "Salty", "Sweet", "Sour", and "Bitter". Below the columns are various food icons for classification.

What I Smell

Display Science Card 3 and ask:

- What do you think these materials smell like?
- Do they all have a smell?
- What items in our classroom have a smell? Can you describe the smell?

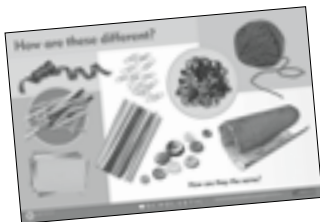
Work with students to develop a list of descriptive terminology for the sense of smell (e.g., stinky, unpleasant, pleasant, strong, weak, fresh, sharp, pungent, putrid, aromatic, musky, etc.). Add the words to the Anchor Chart.

Taste Sensations

Ask students to classify the items in their lunches as salty, sweet, sour, or bitter. Add these descriptive words to the Anchor Chart. Create a chart to list students' suggestions of foods or beverages to fit each category. Provide prompts such as:

- Crackers are salty. What else do you know that is salty?
- What do you eat or drink that is sweet?
- Have you ever tasted a lemon? What did it taste like?
- Dark chocolate can taste bitter. What else do you eat or drink that is bitter?
- Do you eat or drink anything that has no taste?

CONSOLIDATE



Attributes of Materials

Display Science Card 5 and have students identify attributes of the materials shown, e.g., colour, size, shape, lustre, and texture. Students may also describe the sound the items would make, if applicable. You might provide samples of the materials for students to examine. Provide prompts such as:

- What colour is the material?
- What is its shape?
- How long is it? How short is it?
- How does it feel?
- Does it make a sound?

Continue to record descriptive terminology as suggested by students on the class Anchor Chart. Post the completed chart where all students can see it.

Barrier Games

Provide pairs of students with some kind of barrier such as three sides of a cardboard box or an open, upright book. Students sit facing their partner with the barrier set up between them. Each student has a variety of materials hidden on their side of the barrier. Explain that they cannot peek around the barrier! Students take turns using their senses to describe materials for their partners to identify.

Sensory Teams

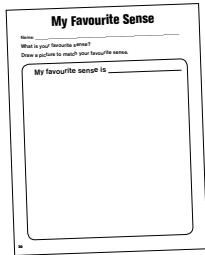
Divide the class into sensory teams for each sense and provide each team with a set of descriptive terminology flash cards. Present a material and have teams select the most appropriate descriptive term to describe it. Ensure cards include “tasteless,” “odourless,” “colourless,” and “should not be tasted.”

Describing Favourites

Have students discuss their favourite sense with a partner. Provide prompts such as:

- **What is your favourite sense? Why is it your favourite?**
- **How do you use your favourite sense?**
- **What item or experience reminds you of your favourite sense?**

Distribute copies of BLM *My Favourite Sense*. Students name their favourite sense, draw a picture of an item or experience that represents this sense, and use descriptive terminology to describe it. Students might take a class survey of favourite senses, collect the data, and make a graph of the class' favourite senses. Have students store their completed BLMs in their Science Folders.



EXPLORE MORE

Make a Menu

Students can create a menu for a restaurant by drawing foods or cutting pictures of foods from magazines. Students can then orally describe the menu items using descriptive, sensory vocabulary. Refer students to the Anchor Chart for descriptive terminology. Or, you may choose to have someone scribe students' descriptions of the foods.

My Favourite Sense

Name: _____

What is your favourite sense?

Draw a picture to match your favourite sense.

My favourite sense is _____

How Do You Use Your Senses?



Focus: Students use their senses to group and sequence materials according to their attributes. Students will further their understanding of some of the attributes of materials such as colour, texture, shape, and size.

Specific Curriculum Outcomes

Students will be expected to:

- 9.0 sequence or group materials and objects [GCO 2]
- 18.0 communicate procedures and results [GCO2]

Performance Indicators

Students who achieve these outcomes will be able to:

- use their senses to group a collection of stuffed animals or plastic figurines and other materials according to their own criteria
- use their senses to sequence materials according to criteria, for example, sequence paint swatches from lightest to darkest

NOTES:

Attitude Outcome Statements

Encourage students to:

- show interest and curiosity about objects and events within their immediate environment [GCO 4]

Cross-Curricular Connections

Math

It is expected that students will:

- demonstrate an understanding of measurement as a process of comparing (identifying attributes that can be compared) [1SS1]
- demonstrate an understanding of repeating patterns [1PR1]

English Language Arts

Students will be expected to:

- communicate information and ideas effectively and clearly, and to respond personally and critically [GCO 2]

Getting Organized

Program Components	Materials	Before You Begin	Vocabulary
• Science Card 6 • IWB Activity 5 • IWB Activity 6	• stuffed animals or plastic figurines • variety of materials to group and sequence • students' Science Journals • xylophone or water xylophone and wooden spoon	• Set up mini centres to enable students to group and sequence materials by attributes.	• group • sequence

Science Background

- Scientists use their five senses to observe attributes in order to distinguish the differences between materials.

■ Grouping

ACTIVATE

Grouping Materials

Display Science Card 6. Work with students to group the toys by type of stuffed animal. Then challenge students to find different ways to group the items based on attributes. Ask:

- How else could you group the toys?



Encourage students to consider attributes such as colour, texture, shape, etc. Ask students to explain their procedure each time they create a new group.

You might also provide a collection of stuffed animals or other objects such as plastic figurines for students to group according to attributes. Ask parents to send in some plastic figurines at the beginning of the unit. Ask:

- **What is your rule for putting the objects into groups?**
- **Can you use the objects to create a pattern?**

CONNECT

IWB Activity:

- Challenge students to group items based on their own sorting rules using Activity 5: *Using your senses to group* (see the Teacher's Website).

Grouping by Attributes

Set up mini centres to enable students to group materials by attributes. Small groups of students can cycle through the centres or, if students need more assistance, the explorations could be completed for one material at a time with the whole group.

Mini centres could include:

- materials such as paint swatches or crayons to group as dark or light
- water samples to group as salt water, sugar water, or plain water
- various plastic bottles to group according to those that make a sound when air is blown across the top of them and those that don't
- Lego blocks to group by colour or shape
- seeds to group by appearance

Encourage students to share their procedure and results with a partner each time they create a new grouping.

CONSOLIDATE



Drawing a Group

Have students draw one grouping in their Science Journals. For example, students could group crayons as dark colours or light colours, then use the crayons to draw it. Ask students to explain their sorting criteria to a partner.

■ Sequencing

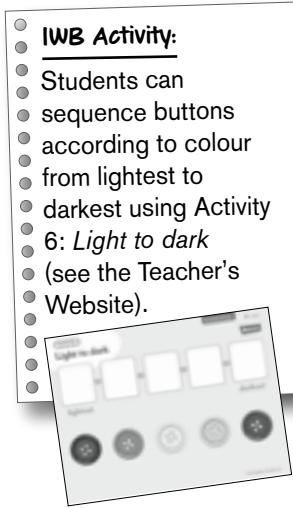
ACTIVATE

Sequencing Sounds

Remove or switch some keys from a xylophone and have students help you to determine the proper sequence based on pitch. Alternatively, you can fill several same-size drinking glasses with water at different levels. When you strike the glasses lightly with a wooden spoon, sounds of different pitches are created. Switch the placement of some of the glasses and invite students to help you sequence them appropriately. Ask:

- **Could you have used a different sense to solve the problem?**

CONNECT



Sequencing by Attributes

Set up mini centres to enable students to sequence sets of items according to their attributes. Small groups of students can cycle through the centres or, if students need more assistance, the explorations could be completed for one sense at a time with the whole group.

Mini centres may include:

- paint swatches or crayons to sequence from lightest to darkest
- glasses in a water glass xylophone or a set of tuning forks to sequence from highest to lowest pitch
- squares of sandpaper to sequence from roughest to smoothest
- scents to sequence from weakest to strongest

Encourage students to share their procedure and results with a partner each time they create a new sequence.

CONSOLIDATE



Drawing a Sequence

Have students draw one of their sequences in their Science Journals. For example, students could sequence crayons from darkest to lightest, then use the crayons to draw it. Have students discuss their sequence with a partner.

EXPLORE MORE

Rethinking

Add a new material to a collection that forces students to rethink their grouping or sequencing. Provide prompts such as:

- Does your sorting rule still work?
- Does this new item change how you would group the materials?
- How does this new item change your sequence?

How Can You Change the Smell and Taste of Food?



Focus: Students use their senses to discuss and observe ways the smell and taste of food can be changed.

Specific Curriculum Outcomes

Students will be expected to:

- 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]
- 1.0 pose questions that lead to exploration and investigation [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- use their senses to demonstrate and describe how food can be changed to alter its smell and taste
- make gelatin according to teacher's directions

NOTES:

Attitude Outcome Statements

Encourage students to:

- be open-minded in their explorations [GCO 4]
- work with others in exploring and investigating [GCO 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 [GCO 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 [GCO 8]

Getting Organized

Program Components	Materials	Before You Begin	Vocabulary
• Science Card 7 • IWB Activity 7 • BLM <i>What My Senses Tell Me</i> (p. 16) • BLM <i>Procedural Organizer</i> Literacy Place: <i>Making Ice Cream</i> (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 • set 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 waft odours to 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.

- 1

☐ ☐ ☐ ☒ ☐

- □ □ □ □

[illegible]

☐ ☐ ☐ ☒ ☐

☐ ☐ ☐ ☐

- ☐ ☐ ☐ ☐

☐ ☐ ☐

□ □ □ □ □

5

- ☐ ☐ ☐ ☒ ☐ ☐ ☐

1001

☐ ☒ ☐ ☐

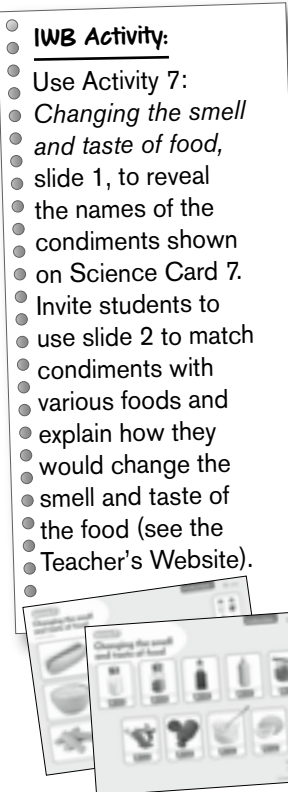


IWB Activity:

Use Activity 7:
Changing the smell and taste of food,
slide 1, to reveal
the names of the
condiments shown
on Science Card 7.
Invite students to
use slide 2 to match
condiments with
various foods and
explain how they
would change the
smell and taste of
the food (see the
Teacher's Website).

IWB Activity:

Use Activity 7:
Changing the smell and taste of food, slide 1, to reveal the names of the condiments shown on Science Card 7. Invite students to use slide 2 to match condiments with various foods and explain how they would change the smell and taste of the food (see the Teacher's Website).



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 oatmeal before and after the addition of boiling water, peppercorns 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?

The form is titled "What My Senses Tell Me" and includes a line for the student's name. Below the name line is a large rectangular box for "look" with an eye icon. To the left of this box is a smaller box for "touch" with a hand icon. To the right of the "look" box is a box for "smell" with a nose icon. Below the "look" box is a box for "hear" with an ear icon. To the right of the "hear" box is a box for "taste" with a tongue icon.

What My Senses Tell Me

Write or draw what you see, touch, smell, taste, and hear.

see	
touch	smell
hear	taste



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 sense 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.



Literacy Place Connection:

Revisit or read *Making Ice Cream* by Barbara Hehner 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.

--

How Can You Change the Look and Feel of Materials?



Focus: Students will manipulate different materials to change their appearance and texture.

Specific Curriculum Outcomes

Students will be expected to:

- 21.0 investigate ways that materials can be changed to alter their appearance and texture [GCO 2]
- 1.0 pose questions that lead to exploration and investigation [GCO 2]
- 22.0 use appropriate tools [GCO 2]
- 13.0 propose an answer to an initial question or problem and draw a simple conclusion [GCO 2]
- 5.0 follow safety procedures and rules [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- use the inquiry process and their senses to investigate how to change the appearance and texture of a material

NOTES:

Attitude Outcome Statements

Encourage students to:

- willingly observe, question, and explore [GCO 4]
- consider their observations and their own ideas when drawing a conclusion [GCO 4]
- show concern for their safety and that of others in carrying out activities and using materials [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- speak and listen to explore, extend, clarify, and reflect on their thoughts, ideas, feelings, and experiences [GCO 1]
- interpret, select, and combine information using a variety of strategies, resources, and technologies [GCO 5]

Getting Organized

Program Components	Materials	Before You Begin	Vocabulary
• Science Card 8 • IWB Activity 8 • <i>The Hockey Tree</i> (Read Aloud) • <i>Seeing Red</i> (Read Aloud) • <i>What Is the Inquiry Process?</i> poster	• hot-air popcorn popper and popcorn kernels • construction paper • dry tree “rounds” (one per group) • students’ Science Journals • variety of plastic and rubber hockey pucks plus tree “rounds” (dry and wet) • materials whose appearance and texture can be changed such as modelling clay, rough, unpainted wood, bananas, bread, artificial nails, marshmallow, soap, soda cracker • tools for changing the appearance and texture of the chosen materials such as scissors, paint, crayons, water, sandpaper • digital camera	• Gather tree “rounds”—hockey-puck sized slices from fallen trees. • You may wish to have one or two volunteers available to supervise students who need to use a piece of equipment to change the appearance and texture of materials.	• sight • touch

Safety

- Ensure students follow safety procedures including wearing safety goggles when working with tools. You may refer students to the safety chart created previously.

ACTIVATE

Describe Popcorn

Distribute samples of popcorn kernels to each student and have them examine the kernels. Ask:

- How does the popcorn feel?
- How does the popcorn look?
- What is the mass of the popcorn? How could we find out?

Use a hot-air popper to pop the popcorn. Distribute samples of the popcorn to each student. Ask:

- How does this popcorn feel?
- How does this popcorn look?
- What is the mass of this popcorn?
- What is the height of the largest pop? How could we find out?
- What do you think caused the look and feel of the popcorn to change?
(Lead the students to realize that heat caused the popcorn to change.)

IWB Activity:

- Have students use Activity 8: *Before and after* to match the images of materials before and after they have been changed (see the Teacher's Website).



Changing Paper

Hold up a piece of construction paper and invite students to suggest ways they could change the paper to alter what it looks and feels like. Ask students to discuss their ideas with a partner. Provide prompts such as:

- What does the paper look and feel like?
- How could you change it?
- Which tools or materials would you use to change it?
- What do you think it would look and feel like after the change?

Invite a few pairs to share their ideas with the class.

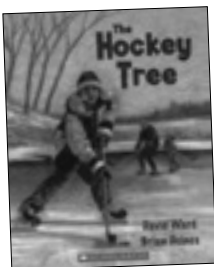
CONNECT



Match and Compare

Display Science Card 8. Have students examine the photos and invite them to match the before and after images. Have students identify the differences between the matching items in terms of look and feel; and what was done to change each one. Provide prompts such as:

- Look at the [roll of aluminum foil]. What does it look like?
- Find the image of [the foil] after it has been changed. What does it look like?
- How was it changed?
- Do you think any tools were used to change it?
- What other ways could some of the materials have been changed?
- Can you think of other items that could have been included on the card?



Hockey Tree Pucks

Remind students of the story *The Hockey Tree* and discuss how the family created a replacement for their lost puck. If necessary, reread pages 14-23.

Ask:

- **What material did they use?**
- **What did they do to change the look and feel of the material?**

Tell the students that they are going to work in small groups to investigate how to make a puck similar to the one in the story. Provide each group with “rounds” from local trees that are about the same size as a hockey puck.

Ask:

- **What does it look like?**
- **How does it feel?**
- **What can we do to change this into a useful hockey puck?**

As a whole group, discuss what actions students will take to create their tree pucks. Ask:

- **What actions did the family take in the story?**
- **What did they do first?**
- **What did they do next?**

Lead students to consider sanding the tree rounds smooth, soaking them in water, and then freezing them. Students can gather the tools they need and use them to carry out their plan. When complete, invite each group to examine their pucks. Provide prompts such as:

- **What does it look like?**
- **How does it feel?**
- **How is it the same as a real puck?**
- **How is it different?**



Have students explore their pucks and compare them to real hockey pucks. They could compare the mass, size, texture, sounds when dropped, etc. Ask students to record their observations and results in their Science Journals. You might ask each group to explore a different attribute and then share their results with the whole group.

Provide a variety of pucks made from different materials such as plastic and rubber as well as hardwood tree rounds that are dry, wet, and wet and frozen. Invite students to develop questions they would like to test with the pucks, for example, which puck will slide the furthest or move the fastest. Allow students time to test the pucks and then, as a group, create a conclusion to answer the initial question.

CONSOLIDATE

Read Aloud: *Seeing Red*

Before Reading



Explain to students that you will be reading a book about two boys, Alex and Arie, who are best friends and want to have the same colour of hair.

Set a purpose for listening by asking students to listen as you read to discover what the boys do to try to change the look of their hair and to predict whether their actions will work in each case.

During Reading

As you read the story to students, pause frequently to discuss the text and illustrations. Alternate between asking students to respond in a whole group or with a partner. Prompts for discussion could include:

Page 2:

- **When Alex asks, “What is the secret?” what question is he really asking?** (What did you do to get red hair?)
- **Arie says that he wasn’t born with red hair but that he turned it red by eating tomatoes. Do you think Alex’s hair will turn red if he eats ten big red tomatoes? Why or why not?**

Page 4:

- **What is Alex’s plan for changing his hair colour? What materials does he need?**
- **When Alex looks at his hair in the mirror, what is he doing?** (He’s making an observation.)
- **Did eating the tomatoes change Alex’s hair colour?**

Page 6:

- **What do you think Alex will do next? Will he modify his plan?**
- **Do you think it will make his hair red?**

Page 10:

- **How does Alex know if his plan is working or not?** (He makes observations.)

Page 12:

- **I wonder what Alex will do now. Will he modify his plan again?**
- **Do you think it will make his hair red?**

Page 16:

- **Alex thought about his results. Did his plan to turn his hair red work?**
- **What conclusion did he make?** (The plan didn’t work. Arie was fooling him.)

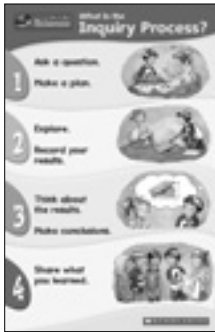
Pages 18–28: Lead students through a similar discussion for Arie’s plan to change his hair black.

- **What is Arie’s plan? What materials will he need?**
- **Do you think his plan to turn his hair black will work?**
- **How does he know if his plan is working or not?** (He makes observations.)
- **Did Arie’s plan work? What conclusion did he make?**

Page 30:

- **What new plan did Alex and Arie make?**
- **Did it work? How did their hair change?**
- **How did they share their solution?**

After Reading



Point out the *What Is the Inquiry Process?* poster. Read the steps with the students and compare the process Alex and Arie used with the steps on the poster. Provide prompts such as:

- **What question did Alex and Arie want to answer?**
- **What was their plan to change the look of their hair?**
- **What materials did they need?**
- **How did making observations and thinking about their results help them to modify their plan?**
- **Did their plan work?**
- **How did they end up answering their question and solving their problem?**
- **Do you think a problem can be solved in more than one way?**

Changing the Look and Feel of Materials

1. Organize the class into small groups. Explain to students that they are going to investigate how to change both the look and feel of a material. Distribute a different material to each group. Or, if students are ready, you may allow them to choose the material they would like to investigate. Possible materials to use include modelling clay; rough, unpainted wood; bananas; bread, artificial nails, marshmallow, soap, and soda crackers.
2. Ask the groups to generate questions that they would like to investigate using their material. For example, what would happen if you soaked a peeled banana in water and then placed it in the freezer overnight?
3. Once the groups have chosen a question and discussed it with you, they can select the materials and tools they need to conduct their investigation and use them to carry it out. Ensure resources the students require such as scissors, paint, sandpaper, crayons, and water are readily available.



4. Have students record their observations before their investigation in their Science Journals. Students might choose to take digital photographs during their investigation. Provide prompts such as:

- **How does the material feel?**
- **What colour is it?**
- **What shape is it?**
- **How big is it? How small is it?**
- **How long is it? How short is it?**

Ask them to predict what will happen.

5. After their investigations, students can add their new observations and draw a conclusion based on how the material was changed. Provide prompts such as:

- **Did the action cause the look and feel of your material to change? How?**



6. Invite students to share their investigations and explain how the change altered the look and feel of the materials. Ask what new questions they may have and record these on the I Wonder Wall or in a scrapbook for future investigations.

EXPLORE MORE

Design a Science Card

Students can take digital photographs of materials before and after the look and feel has been changed. They can use these photographs (or pictures cut from magazines) to create their own Science Cards and challenge other students to match the items.

What Sounds Can Materials Make?



Focus: Students use their senses to recognize sounds and to manipulate materials to make and alter sounds.

Specific Curriculum Outcomes

Students will be expected to:

- 23.0 investigate ways that materials can be changed to alter the sounds they make [GCO 1/3]
- 24.0 select and use materials to carry out their own explorations and investigations [GCO 2]
- 8.0 communicate while exploring and investigating [GCO 2]
- 18.0 communicate procedures and results [GCO 2]

Performance Indicators

Students who achieve this outcome will be able to:

- manipulate materials to make sounds
- demonstrate how to alter the sounds materials make

NOTES:

Attitude Outcome Statements

Encourage students to:

- willingly observe, question, and explore [GCO 4]
- be open-minded in their explorations [GCO 4]
- work with others in exploring and investigating [GCO 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 [GCO 2]
- create texts collaboratively and independently, using a variety of forms for a range of audiences and purposes [GCO 9]

Getting Organized

Program Components	Materials	Before You Begin	Vocabulary
• Science Card 9 • IWB Activity 9 • Science Card 10	• digital recorders • variety of materials that can be used to make sounds (alone or in combination)		• hear • sound

Science Background

- Sound can be categorized according to pitch (high or low) and volume, or loudness. Students will readily identify loud and soft sounds but they may need experience with contrasting high and low sounds to recognize differences in pitch.

Possible Misconceptions

- Students may believe that we can hear all sounds from very high to very low. Explain that while humans with normal hearing can tell the difference between 1500 sounds, some very high-pitched or very low-pitched sounds can't be heard by humans. This is why we can't hear the sound of a dog whistle.

ACTIVATE

Describe Sounds:

Ask students to describe sounds they've heard. If necessary, suggest some sounds for the students to mimic by asking:

- **What sound does a bird make?** (chirp, chirp)
- **What sound does a dog make?** (woof, woof)
- **What sound does car horn make?** (honk, honk)
- **What sound does a small boat motor make?** (putt, putt)

Identify Sounds

Display Science Card 9 and have students examine the illustration. Ask students to identify what sounds they would hear and what makes the sounds. Provide prompts such as:

- **What sounds would you hear?**
- **What do the lines coming from the gull's mouth show?**
- **Are there other lines like this in the illustration? What do they show?**
- **Which sounds are loud?**
- **Which sounds are soft?**
- **Which sounds are high-pitched?**
- **Which sounds are low-pitched?**



CONNECT

IWB Activity:

- Students can use Activity 9: *What sounds do instruments make?* to match each sound to the instrument which makes it (see the Teacher's Website).



Sound Scavenger Hunt

Organize the students into small groups. Each group chooses a location in the school and uses a digital recorder to collect sounds in that location. When groups have recorded their sounds, they can challenge other groups to listen to the sounds and identify the location.

Note: This activity may require a volunteer to accompany students and provide supervision and assistance as needed.

Making Sounds

Display Science Card 10 and have students look at the various materials shown. Ask:

- **How can these materials be used to make sounds?**
- **Would any tools help you to make sounds with the materials?**
- **Can you think of other materials that could make sounds?**

Choose one or more materials and model different ways to use the materials to make sounds. Ask:

- **How did I make sounds with this material? What was my procedure?**
- **What else could I do to make sounds?**
- **Would a tool help me to make sounds with the material?**

Provide small groups with a variety of items (e.g., elastics, plastic bottles, aluminum pie plates, etc.) and have students explore ways to use the materials to make sounds. Encourage students to share their questions, ideas, and intentions with their group as they explore. Provide prompts such as:

- **Are you wondering about anything?**
- **What question are you trying to answer?**
- **Do you have any ideas about how to use the materials to make a sound?**
- **What will you do to make sounds?**

CONSOLIDATE

Changing Sounds

Once the students have had ample time to explore ways to make sounds with the materials, tell the students that you want them to be engineers and find ways to change the sounds. Ask:

- **How could you alter the material to change the sound it makes?**
- **Would any tools help you to change the sounds?**
- **Do you have any new questions?**



Invite students to present their findings to the class by explaining how they made sounds with the materials and how they altered the materials to make new sounds. Ask several students to demonstrate their procedure. Add any new questions to the I Wonder Wall.

EXPLORE MORE

Sound Effects

Invite students to use a variety of materials to create sound effects for a story, book, or movie clip.

WRAPPING UP THE UNIT



Revisit any remaining questions posted on the I Wonder Wall and have students discuss answers in small groups or with a partner. If there are questions which cannot be answered at the time, these can remain on the I Wonder Wall for students to research independently. Discuss what the students have learned about our five senses; how they help to keep us safe; and how we can use them to describe materials and learn about the world around us.

Specific Curriculum Outcomes Checklist

Name: _____ Date: _____

Rating: 1 – not evident; 2 – with assistance; 3 – mostly on own; 4 – on own consistently

Specific Curriculum Outcomes	Rating and Observations
16.0 explore how each of the senses helps us recognize and safely use materials [GCO 1/3]	
17.0 explore attributes of materials we can learn to recognize through each of our senses [GCO 1/3]	
18.0 communicate procedures and results [GCO 2]	
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]	
21.0 investigate ways that materials can be changed to alter their appearance and texture [GCO 1/3]	
22.0 use appropriate tools [GCO 2]	
23.0 investigate ways that materials can be changed to alter the sounds they make [GCO 1/3]	
24.0 select and use materials to carry out their explorations and investigations [GCO 2]	
1.0 pose questions that lead to exploration and investigation [GCO 2]	
3.0 communicate using scientific terminology [GCO 2]	
5.0 follow safety procedures and rules [GCO 2]	
8.0 communicate while exploring and investigating [GCO 2]	
9.0 sequence or group materials and objects [GCO 2]	
13.0 propose an answer to an initial question or problem and draw a simple conclusion [GCO 2]	

My Inquiry

Name: _____

My question:

My plan:

My results:

My conclusion:

How I will share what I learned:

Student Self-Assessment of Inquiry Process

Name: _____

Rating Scale  = Great  = Good  = Needs to be better

Step 1			
I asked a question.			
I made a plan.			
Step 2			
I followed my plan.			
I recorded my results.			
Step 3			
I thought about my results.			
I made a conclusion.			
Step 4			
I shared what I learned.			

Teacher Assessment of Inquiry Process

Name: _____ Date: _____

	1	2	3	4
Initiating and Planning				
• poses a question that leads to exploration or investigation				
• makes a prediction based on an observed pattern				
• makes a simple plan				
• selects and uses materials				
Performing and Recording				
• carries out the plan/follows a simple procedure				
• uses appropriate tools				
• makes observations				
• records observations and measurements				
• uses a variety of sources of information and ideas				
• follows safety procedures and rules				
Analyzing and Interpreting				
• sequences or groups materials and objects				
• proposes an answer to the initial question and draws a simple conclusion				
• poses new questions that arise from what was learned				
Communicating and Teamwork				
• communicates while exploring and investigating				
• communicates using scientific terminology				
• communicates procedure and result				
• responds to ideas and actions of others in constructing their own understanding				

Comments:

Inquiry Process Rubric

	Level 1	Level 2	Level 3	Level 4
INITIATING AND PLANNING	talks about things that are of interest makes guesses about the outcome of an inquiry with prompting, offers ideas for a procedure with prompting, identifies some materials which could be used to carry out the plan	asks simple questions about objects and events that are observable makes simple predictions about the outcome of an inquiry, but they may be hoped-for outcomes contributes ideas for a procedure, but they may not be complete identifies some materials which could be used to carry out the plan	uses observations to ask questions to investigate, but questions are not always realistic makes simple predictions about the outcome of an inquiry based on prior observations provides ideas for a simple procedure selects and uses materials to carry out the plan	uses observations and prior knowledge to ask questions to investigate makes thoughtful predictions about the outcome of an inquiry based on prior observations and knowledge provides clear, sequential steps for a simple procedure selects and uses appropriate materials to carry out the plan and explains reasons for choice
PERFORMING AND RECORDING	carries out the plan/ follows a simple procedure with prompting with prompting, uses some appropriate tools with assistance makes simple observations using senses with prompting, records observations and measurements gets information from a teacher-chosen source needs help to follow safety procedures and rules	carries out the plan/ follows most of a simple procedure selects and uses common tools makes some relevant observations using senses records observations and measurements which may be incomplete identifies some relevant information from familiar sources needs occasional prompting to follow safety procedures and rules	carries out the plan/follows a simple procedure selects and uses some appropriate tools makes relevant observations using appropriate senses records observations and measurements accurately identifies relevant information from sources of the same type follows most safety procedures and rules	carries out the plan/ follows a simple procedure, making adjustments as necessary selects and uses all appropriate tools makes relevant, detailed observations using appropriate senses records observations and measurements accurately in a variety of ways identifies relevant information from a variety of sources follows all safety procedures and rules and explains why they are needed

Continued on next page...

Inquiry Process Rubric (Continued)

	Level 1	Level 2	Level 3	Level 4
ANALYZING AND INTERPRETING	sequences or groups materials and objects based on simple teacher-chosen attributes describes what happened with prompting, identifies some new questions but they may not be about this inquiry	sequences or groups materials and objects based on a few simple attributes draws a simple conclusion based on observations, but may not link conclusion to the initial question identifies some simple new questions on the topic of this inquiry	sequences or groups materials and objects based on multiple attributes draws a conclusion based on observations which link to the initial question identifies some new questions on the topic of this inquiry that could be investigated	accurately sequences or groups materials and objects based on multiple attributes draws a conclusion based on observations and states if it supports or refutes their prediction identifies new questions on the topic of this inquiry and suggests how they could be investigated
COMMUNICATING AND TEAMWORK	willingly asks for help and accepts help from other group members understands some scientific terminology but rarely uses it with prompting, describes the result and some of the procedures with prompting, asks some questions related to new learnings	makes suggestions to group members as to what should be done understands simple scientific terminology, but does not always use it correctly communicates basic information about the result and most of the procedures asks some questions related to new learnings, but may not fully understand the information	communicates with group members, sometimes with problems usually uses scientific terminology appropriately communicates most of the information about the result and procedures asks some questions in order to understand new learnings	communicates and works effectively with group members consistently uses scientific terminology appropriately accurately communicates the information about the result and procedures asks clarifying questions in order to fully understand new learnings

Additional Resources

Non-fiction Books

Animal Senses: How Animals See, Hear, Taste, Smell, and Feel, by Pamela Hickman (Kids Can Press, 1998)

Look, Listen, Taste, Touch, and Smell, by Pamela Hill Nettleton (Compass Point Books, 2005)

The 5 Senses, by Nuria Roca (Barron's Educational Series, 2006)

The Five Senses Series, by Rebecca Rissman (Heinemann, 2010)

The Five Senses, by Hervé Tullet (Tate Publishing, 2005)

The Listening Walk, by Paul Showers (HarperTrophy, 1991)

The Sense of Hearing, by Elaine Landau (Children's Press, 2009)

The Sense of Sight, by Ellen Weiss (Children's Press, 2008)

The Sense of Smell, by Ellen Weiss (Children's Press, 2009)

The Sense of Taste, by Ellen Weiss (Children's Press, 2008)

The Sense of Touch, by Elaine Landau (Children's Press, 2008)

You Can't Smell a Flower with Your Ear, by Joanna Cole (Penguin Young Readers, 1994)

Picture Books

Helen Keller: the World in Her Heart, by Lesa Cline-Ransome (HarperCollins, 2008)

Hello Ocean, by Pam Munoz Ryan (Charlesbridge, 2001)

Looking Closely Along the Shore, by Frank Serafini (Kids Can Press, 2008)

Looking Closely Inside the Garden, by Frank Serafini (Kids Can Press, 2008)

Looking Closely Through the Forest, by Frank Serafini (Kids Can Press, 2008)

Pancakes for Breakfast, by Tomie dePaola (Houghton Mifflin Harcourt, 2001)

Step Gently Out, by Helen Frost (Candlewick, 2012)

Swirl by Swirl: Spirals in Nature, by Joyce Sidman (Houghton Mifflin, 2011)

The Blind Men and the Elephant, by Karen Backstein (Scholastic, 2002)

Websites for Students

BBC: School Science Clips – Sound and Hearing
http://www.bbc.co.uk/schools/scienceclips/ages/5_6/sound_hearing.shtml

BBC: School Science Clips – Grouping Materials
http://www.bbc.co.uk/schools/scienceclips/ages/6_7/grouping_materials.shtml

Explore More – Hearing; Sight; Smell; Taste; Touch
<http://www.tvokids.com/shows/exploremore>

Websites for Teachers

Soundbible.com – Sound Effects
<http://www.soundbible.com/free-sound-effects-1.html>

Dear parents and caregivers,

We are about to start a new unit in science where we will be exploring materials and our senses. Through a variety of hands-on explorations and investigations, your child will be learning about the five senses and how these senses can be used to help us learn about the world around us and how they help to keep us safe from harm.

You can talk to your child at home about the senses and how we use them to describe materials. You might play “I Spy” with your child, having your child describe materials for you to identify.

You can plan some activities with your child to focus on their senses, for example,

- go for a walk and talk about what your child sees, hears, and smells
- find something in your home that has an interesting texture
- have a “tasting party” and taste things that are sweet, sour, salty, or bitter

You can invite your child to help you prepare food by adding or mixing ingredients. Discuss how you can alter the look and feel of the materials as well as changing the smell and taste of food.

To ensure a wide range of experiences and make connections between this topic and your child’s world, he/she may choose to bring one or more personal items to school for exploration during in-class activities. These items will be returned home once explorations are completed. To determine whether the item(s) is appropriate please contact me, your child’s teacher.

Sincerely,