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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.

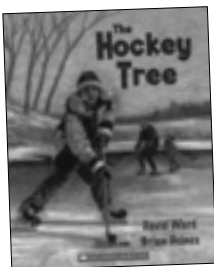
CONNECT



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.)

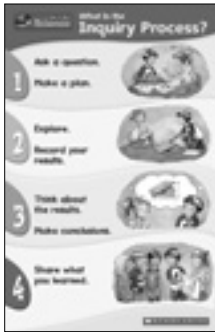
Pages 18–28: Lead students through a similar discussion for Arie’s plan to change his hair black.

- **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.