GRADE: Kindergarten
ACTIVITY TITLE: Snow - To Eat or Not to Eat? / La neige - peut-on la manger?

KEY WORDS:	**MOTS CLÉS:**
winter	hiver
snow	neige
ice	glace
crystal	crystal
filter	filtre
vapour	vapeur
melt	fondre
particles	particules

INTRO: Students filter samples of snow from around the school yard to determine whether snow is clean enough to be ingested.

INQUIRY TYPE: Scientific Inquiry: Experimentation Teacher-centered

MATERIALS RESOURCES:

In the Catalyzer:
coffee filters
(16 oz) plastic cups

Teacher Provided:
snow
paper towels
plastic containers (e.g., margarine, yoghurt, etc.) with lids for collecting snow (one per group)
sheets of black paper or black fabric
magnifying glasses (hand lens) found in Stage 1 Catalyzer
bowls (one per group)
cups / scoops for measuring water (one per group - must be the same size)
small sample of orange juice or lemonade (must have pulp)
chart paper and markers

TARGET PROCESS SKILL: Inquiry: Experimentation (Plan & Conduct Investigations; Collect Data)

STRAND: N/A (Matter & Materials; Earth &Space)

BIG IDEA:
Most snow is, in a sense, dirty and when found on the ground especially should not be consumed without filtration.

ENGAGE:
Prep: You will want to choose a day when large snowflakes are falling. (You could also do this activity immediately following a snowfall.)
Place black paper or fabric in the freezer for a couple hours.
Pre-label containers with different locations around the school yard (e.g., entrance way, field, playground equipment, bike rack, garden, etc.). You will want to use a permanent marker to label the containers so the labels won't smear or wash away when wet.
Label one container as "new snow" or "falling snow". This container should catch falling snow (before it hits the ground).
You may want to enlist extra adult helpers or older student helpers for the outside portion of this activity as well as for the testing section (see "Extend" below).

- Have the children look out the window at the falling snow. Then complete the Thumbs Up, Thumbs Down diagnostic activity (see the "Evaluate" section below).
- Tell children that they will have a chance to be scientists and look at the snow in more detail. Discuss the work of scientists - how scientists ask questions and try to find the answers to their questions by observing and testing. Inform students that today as scientists they will start by observing snow; they will carefully examine the snow in detail, using their senses (what does it look like, smell like and feel like). They will also have an opportunity to use a magnifying lens (hand lens) to look at the snowflakes more closely.

- Have students put on their outdoor clothing. Once outside, meet as a large group. Explain to the students that they will be catching snowflakes onto the black construction paper. They should look at the shape of the snowflakes under the magnifying lens.
- Handout the black paper and the magnifying glasses. Allow students some time to observe snowflakes (10-15 min).

- Reconvene as a large group. Collect materials.
- Ask the children if they have ever tried to catch snowflakes on their tongues. What did they taste? What is inside a snowflake?
- Distribute the label containers to the students. Assign pairs or small groups of students to different locations in the school yard and have them collect snow from their designated area. Remember to allow one container to catch the falling snow.

- Reconvene as a large group once more. Ensure everyone has an adequate sample of snow, place lids on containers and proceed back inside to begin the melting experiment.

EXPLORE:
- Place the samples of snow onto a table or counter top close by, while working through the next section. (You will want to be able to access them.)
- Use TM-2: I Wonder (Chart) to record students observations and questions about the snowflakes they examined outside.
- Have students examine the samples of melting snow to generate additional observations and questions. Ask students what is happening (or has happened) to the snow.
- You may choose to have students draw the snowflakes that they observed outside.

EXPLAIN:
(Hopefully by now the samples of snow have melted.)
Prep: Have lemonade or orange juice (with pulp) ready.

The next step involves setting up a test or experiment to answer a question. This process will need to be modelled by the teacher using "think alouds".

- Start by discussing one of the observations you had made while observing the snow outside. (If it wasn't already included, add this information to the I Wonder Chart.)
  Teacher Prompt: *When I was outside observing the snow, I noticed that the snowflakes were very white and fluffy. They looked so clean to me as I didn't see any dirt on them. I really wanted to taste the snow but I wasn't sure if you could tell how clean snow was just by looking - is it safe to eat? I wonder, how clean is the snow. How could I find an answer to my question?*

- Write your question on the board/or chart paper. Remind students that scientists try to find the answers to their questions by observing and testing - doing experiments. Have children generate possible ways to answer your question. Direct them by asking, "*Is it possible for dirt to be hiding in the snowflake so I can't see it?*" Allow some time for children to discuss this possibility.

- Introduce the filter paper to the class. (Some children may be familiar with it from home.) Demonstrate how it

works by pouring a small amount of juice through the paper (ensure you have bowl under the filter paper to catch the run-off.) Explain how the filter paper has tiny little holes in it that will allow the liquid like water to pass through but not other items like pulp, coffee grinds, dirt, etc. Ensure that students observe both the filter paper and the bowl to examine the difference of the filtered juice.

- Have students consider how the filter paper could be used to see how clean the snow is.

- As a class, generate a list of steps to follow to test the samples of snow. (This should be done as a shared writing activity.) Refer to TM-3: Sample Procedure (Reference) for a list of possible steps. Note that there are 2 sample procedures listed on the handout. The first procedure does not take into account a fair test. This is probably what the class will develop. Prompt students to consider what needs to be done to make the test fair. (The second procedure is modified to demonstrate a fair test.)
  Teacher Prompt: *As I am re-reading through my steps and looking at the samples we have, I have a concern. Sample A has only a small amount of melted snow in the container compared to Sample B. If I pour the smaller amount from Sample A through the filter and then do the same using the larger amount from Sample B, will I be able to say which one is the cleaner sample? That doesn't seem fair. What can I do to ensure that my test is fair?*
- Prompt students to realize that the samples must be of the same amount. Ask the class to suggest what could be used to measure the same amount of melted snow from each of the samples. Go back and adjust the procedure to reflect this change. (Refer to the second procedure on TM-3.)

- Reiterate to students the importance of doing fair tests.
  Teacher Prompt: *In order for scientists to be able to measure results of experiments, tests must be fair. Only one thing can change and the rest must stay the same. For our experiment, we are changing where the snow has been collected. Everything else must be the same (i.e., type of filter paper, amount of sample, etc.).*

EXTEND:

- Divide the class into groups of students (number of groups should equal the number of samples of melted snow). Each group will be responsible for filtering their own sample.
- Each group member should have a role - e.g., Student A - gather materials; Student B - hold filter paper; Student C - measure and pour melted snow.
- All group members should closely observe the filter paper and the water in the bowl. Encourage students to use a magnifying glass to examine their sample.
- You may choose to have students document their results by drawing and labelling a picture.
- Allow each group the opportunity to rotate to see the results of the other groups.

EXPLAIN:

- Reassemble as a large group.
- Discuss the results of the experiment. Consider:
  - When they first investigated the snow with their magnifying lens did they see the particles of dirt in the snow? Why/Why not?
  - What did the groups find on their filter paper? Were all of the samples the same? What is different about each one?
  - Was the resulting amount of debris left over the same for each sample? Why/Why not?
  - Which one seems to be the cleanest?
  - Were any samples totally clean?

EXTEND:

- Explain to the students that snowflakes are formed around small particles of dust; when the snow melts, and the melted snow is filtered, the dust remains on the filter. Each snowflake is different, partially due to the fact that the dust particles about which they form have different sizes and shapes initially.
- Read a book about snowflakes. (Refer to Text References listed below for suggestions.)

EVALUATE:

Diagnostic

- Activate and assess prior knowledge using the "Thumbs Up, Thumbs Down" tactic. (Refer to TM-1: Thumbs Up, Thumbs Down Description (Reference) for more information.) Students, individually, respond with thumbs up

or thumbs down in response to questions or statements given. Students should be prepared to defend their responses. This activity will quickly assess the collective prior knowledge of the group as well as any misconceptions the students may have. Some statements could include:

- It only snows when it is cold outside.
- Snow is made from water.
- All snowflakes are the same.
- It is safe to eat snow.
- You can tell how clean something is by looking at it.

- Review the student's answers and summarize the ideas of the class. (Do not correct any misconceptions at this time.)

Formative

- The teacher should review and respond to the work of each student as they progress through the lesson. (Use TM-4: Skills Continuum Stages 1 & 2 (DRAFT) as reference for development of skills across the grades.)
- The skills of observation and questioning were emphasized in Stage 1 of the Smarter Science program. The quality of observations and questions can be used as diagnostic information as well as formative. Provide suggestions to students about how these skills could be improved.
- Teacher will observe and gather anecdotal evidence of understanding as the students discuss their prior knowledge of snow, including any use of scientific vocabulary. As the teacher and students plan together to do the experiment, the teacher will observe engagement, sense of purpose, and logic in sequencing the experimental phases. The teacher will gather anecdotal evidence of the growing understanding about the nature of snow and decision to eat or not to eat.

BACKGROUND INFORMATION:

Snowflakes are made of ice crystals. They form when water vapour in the clouds cool to below freezing (0 Celsius). They then formed around tiny bits of dirt that have been carried up into the atmosphere by the wind. So snow crystals are really soil particles that have been dressed up in ice. As the snow crystals grow, they become heavier and fall toward the ground. (Snowflakes can be made up of as many as 200 ice crystals.) As they fall from the clouds they pick up pollution in the air. The pollution sticks to the snowflake, then the flake falls to the ground. Most snow is, in a sense, dirty and when found on the ground especially should not be consumed without filtration.

The cleanest snow is found in Antarctica. Since Antarctica is far away from cities and their pollution, the snowflakes aren't as dirty.

Flakes are sometimes a simple shape, but often a snowflake is a complex star with beautiful details. Scientists think that there are really four different shapes of snow crystals. The simplest shape is a long needle shaped like a spike. The other shapes all have six sides. One of them is a long, hollow column that is shaped like a six-sided prism. There are also thin, flat six-sided plates. And lastly there are intricate, six-pointed stars.

LOOK FORS:

Students are:

- making use of several senses in exploring the snow (Stage 1 Skill)
- identifying obvious differences and similarities between the different samples of snow (Stage 1 Skill)
- asking questions about snow (Stage 1 Skill)
- beginning to discuss how questions could be answered (Stage 1 Skill)
- with guidance, planning a simple fair test (Stage 2 Skill)
- with guidance, recording information and results by drawing pictures and/or using words (Stage 2)

SEQUENCE:

This lesson should be part of an ongoing unit on weather. As this is a highly weather-dependent lesson, the lesson can be introduced anytime after the first snow fall.

TEACHING STRATEGIES:

Numbered Heads
Think-Pair-Share
Thumbs Up, Thumbs Down

SAFETY:
Put samples on trays to prevent run-off from spilling onto the floor. Keep paper towels handy to mop up any small spills. Students will need to be reminded not to eat the snow.

BLACK LINE MASTER[S]:
TM-1: Thumbs Up, Thumbs Down Description (Reference)
TM-2: I Wonder (Chart)
TM-3: Sample Procedure (Reference)
TM-4: Skills Continuum Stages 1 & 2 (DRAFT)

TEXT REFERENCES:
Read Aloud
Martin, Jacqueline Briggs. "Snowflake Bentley" Houghton, 1998 ISBN 0395861624
Shulevitz, Uri. "Snow" Farrar, Strauss, 1998 ISBN 0374370923
Wick, Walter. "A Drop of Water" Scholastic, 1997 ISBN 0590221973
Buehner, C. "Snowmen at Night" Scholastic, ISBN 0439692888

Read Aloud/Shared Reading
Weather Set (includes A Rainy Day, A Stormy Day, A Sunny Day, A Cloudy Day, A Snowy Day and A Windy Day)
Time-To-Discover Readers, Scholastic, ISBN 043956702
Keats, Ezra Jack. "The Snowy Day" (Big Book and Teacher Guide) Scholastic, ISBN 0590652397

Independent Reading
Rockwell, A. "The First Snowfall" Aladdin, ISBN 0689716141
Shelf Medearis, Angela. "Here Comes the Snow" (Hello Reader! Level 1) Scholastic, ISBN 0590262661
Marzollo, Jean. "I Am Snow" (Hello Reader! Science. Level 1) Scholastic, ISBN 0590641743
Scherer, J. "One Snowy Day" (Hello Reader! Level 1) Sagebrush Bound, ISBN 0613084845
Briggs, Raymond. "The Snowman" (Step-Into-Reading, Step 1) Random House Books for Young Readers, ISBN 0679994432
Tresselt, Alvin. "White Snow, Bright Snow" HarperCollins, ISBN 0688411614
Reid, Barbara. "Zoe's Snowy Day" Scholastic Trade, ISBN 0590447149
"You See With Your Eyes" (Time to Discover Readers, Kindergarten) Scholastic ISBN: 439567017
"You Smell With Your Nose" (Time to Discover Readers, Kindergarten) Scholastic ISBN: 439567017
"You Taste With Your Tongue" (Time to Discover Readers, Kindergarten) Scholastic ISBN: 439567017
"You Touch With Your Fingers" (Time to Discover Readers, Kindergarten) Scholastic ISBN: 439567017
"Your Five Senses" (Time to Discover Readers, Kindergarten) Scholastic ISBN: 439567017

Science & Tech Curriculum Expectations:
ks6 describe some natural occurrences, using their own observations and representations (e.g., drawings, writing)
ks8 describe and/or represent, using their own observations, patterns and cycles in the natural world
ks9 pose questions and make predictions and observations before and during investigations

Mathematics Curriculum Connections:
km20 demonstrate awareness of non-standard measuring devices (e.g., feet, hand spans, string, or cubes to measure length; hand claps to measure time; scoops of water or sand to measure capacity) and strategies for using them
km21 demonstrate, through investigation, a beginning understanding of the use of non-standard units of the same size

Language Curriculum Connections:
kl7 listen and respond to others for a variety of purposes (e.g., to exchange ideas, express feelings, offer opinions) and in a variety of contexts
kl8 follow one- and two-step directions in different contexts
kl9 use language in various contexts to connect new experiences with what they already know e language to talk about their thinking, to reflect, and to solve\
kl10 use language to talk about their thinking, to reflect, and to solve problems
kl11 use specialized vocabulary for a variety of purposes
kl12 ask questions for a variety of purposes and in different contexts

kl15 orally retell simple events and simple familiar stories in proper sequence
kl29 demonstrate an awareness that writing can convey ideas or messages

kl32 experiment with a variety of simple writing forms for different purposes and in a variety of contexts
kl33 communicate ideas about personal experiences and/or familiar stories, and experiment with personal voice in their writing

Thumbs Up, Thumbs Down

(Grades K to 8)

(Beyond Monet, page 58)

Description

- invites students to share their opinions in a non-threatening environment
- must defend their choice (if they agree or disagree)

Procedures

Step 1 During the discussions about any topic, say, "Thumbs up" if you agree, "Thumbs down" if you disagree, or a horizontal hand wobble if you are unsure, and be prepared to defend your answer.

Prior Knowledge Required

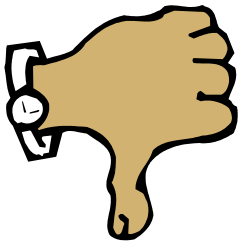
- background information related to the topic

Classroom Management Considerations

- allow students to respond with an "unsure" hand signal
- have students hold their hand close to their chest to keep the responses private so others don't copy their friend's response

Materials

- none



Key Benefits	Effective Uses	Extensions / Modifications
• allows every student to respond to the question • holds each student accountable • provides a quick visual for the teacher • enables students to give opinions on a topic	• use in all subject areas • use to access prior knowledge or review learning	• students write the answer on a piece of paper / small chalkboard / white board, and flip their answers up (yes, no, unsure)

Teacher Notes and/or Reflections:

This handout is taken from: **Instructional Strategies for K to 12** *"Strategies for Teaching"* Recipe Cards - T.V.D.S.B., 2005-2006.

I wonder……

Observed

What do you notice about snowflakes?

sight

smell

touch

I wonder….

Je me demande…….

J’ai observé

Qu’avez-vous observé au sujet des flocons de neige?

la vue

l’odorat

le toucher

Je me demand….

Sample Procedure

1. Collect samples of snow from around the school yard. Place each sample in a labelled container.
2. Let the snow melt.
3. Choose one of the samples.
4. Hold the filter paper over a bowl. Carefully and slowly pour the melted snow over the filter paper into the bowl.
5. Observe the water in the bowl as well as the filter paper. Use a magnifying glass to look carefully at the filter paper.
6. Draw and label what you observed.
7. Repeat with other samples of snow using a new piece of filter paper each time.

Modified - Sample Procedure

1. Collect samples of snow from around the school yard. Place each sample in a labelled container.
2. Let the snow melt.
3. Choose one of the samples. *Measure 1 scoop (or cup) of the melted snow.*
4. Hold the filter paper over a bowl. Carefully and slowly pour the melted snow over the filter paper into the bowl.
5. Observe the water in the bowl as well as the filter paper. Use a magnifying glass to look carefully at the filter paper.
6. Draw and label what you observed.
7. Repeat with other samples of snow using a new piece of filter paper each time.

Grade: K
ACTIVITY TITLE: Finally Big Enough! / Finalement, je suis assez grand pour....

KEY WORDS:	**MOTS CLÉS:**
stilts	des échasses
stable	stable
strong	fort / force
safe	sécuritaire

INTRO:
Students select materials to design and construct a functioning tool to reach a cookie jar.

INQUIRY TYPE: teacher initiated, partially designed; partially student designed, run and tested

MATERIALS RESOURCES:
In the Catalyzer:
velcro strips
elastic bands (very long ones)
twine

Teacher Provided:
string 1 roll
snack jar (a decorated jar would be engaging)
margarine tubs - 10
coffee tins - 10
shoe boxes - 10
scissors - 10
yoghurt containers - 10
snacks (provided by the teacher) - one per student

TARGET PROCESS SKILL:
Technological Problem Solving (Develop Possible Plans; Select & Carry Out the Plan)

STRAND: Structures and Mechanisms

BIG IDEA: Human beings create tools and machines to satisfy needs imposed by the surrounding environment. Some of these, by their properties, work better than others.

ENGAGE:
Part A: "Milling to Music"
- As a class, use the "Milling to Music" activity to assess students experiences with the technological problem-solving (design and build) process. (Refer to the Evaluate section below for more information.)

Part B: The Scenario
- Provide students with the following scenario. (You may choose to have them sit quietly with their eyes closed so they are focused on what you are saying.)

"*Imagine that you have just come home from school. You are very hungry and you remember that there are delicious treats in the snack jar. But the snack jar is kept way up high on the counter. If only you could reach the jar! You try standing on tip toe and reach as high as you can, but it doesn't work. You try asking someone taller than you to get you a snack, but no one has time. How can you get that yummy snack? You are really VERY hungry!*"

- The children need to identify that they are simply not tall enough to reach the snack jar. They need to come up with a device to either make them taller or to extend the reach of their arm so that they can secure the snack. Emphasize that there is truly no one available to help them get the snack from the jar, so they may not build human pyramids or ask someone tall to do the job for them. (It would be most effective if the teacher provided a fancy snack jar for the

children to see, placed on a shelf out of immediate reach.)

Note: It would be an interesting adaptation and lesson in empathy to alter the scenario to be that the children are in a wheel chair and again can not reach the snack jar. If there is a child with this kind of special need in the classroom, the children will be eager to design a functioning tool to allow their friend to reach high things.

EXPLORE:

- Reiterate with students the problem to be solved.

Teacher prompt: *I am really very hungry, but I just can't reach that snack jar. I wonder what device I could build that would help me to reach the jar. Hmmm...what could I build?*

- Use a think-pair-share to have students brainstorm possible methods or devices that could be used to solve the problem. Encourage students to be creative and inventive.
- Then have each student draw a possible solution on a sticky note. (You may choose to use adult volunteers, student helpers and/or senior reading buddies to transcribe the students' descriptions of their drawings. The descriptions could be added directly to the child's sticky note, or on an additional sticky note.)

- Students should share their potential solutions. Accept all ideas. Place sticky notes on the board or on chart paper after they are shared. (Any ideas that are repetitive could be stacked or grouped together.)

Note: If the idea of building stilts or some other device acting as stilts is not one of the students' possible solutions, then you will want to share your own idea with the class and include it on a sticky note along with the rest.

Teacher Prompt: I *know I could reach that snack jar, if only I was a little taller. I wonder if there is anything that I could add to my feet that could make me taller? Once when I was at the circus, I saw a woman walking on these large wooden sticks called stilts. These stilts made her very tall. I think I might be able to make stilts to help me reach the snack jar.*

EXPLAIN:

- Explain the process of technological problem-solving through the work of an engineer.

Teacher Prompt: *There are people who's job it is to plan and build something to solve a problem. These people are called engineers. Does anyone in the class know an engineer? Engineers skillfully plan and build bridges, roads, and other structures. Engineers, when faced with a problem, generate a list of possible solutions. (Just like we did with the sticky notes.)*
An engineer can not possibly build every design/idea that they think of. Some designs are not safe. Some designs require special materials that they may not have. Some designs may take too long to build. They must choose a design...the one that will work best based on safety, materials, time and money.

- Refer the class back to their list of ideas for reaching the snack jar. Discuss with the group which choices may be more doable (capable of working successfully) based on the limitations of time, materials and safety.

Teacher Prompt: *Let's look at our suggested ways for reaching the snack jar. Why don't we put a check mark (✓) beside those suggestions that are "can do now" - the ones we could safely build today? Are there any that we couldn't do today because of the materials that would be needed, or the amount of time required? Are there some ideas that just aren't safe? For those that are "can't do now", we'll mark with an 'X'.*
(Or you may choose to create a t-chart with the headings of "Can Do Now" and "Can't Do Now". The sticky notes with the possible solutions could be grouped under the appropriate heading.)

- Distinguish between those solutions that are "can do now" and "can't do now".

(For example, some examples of "can't do now" because of safety concerns may include: stacking things, throwing something at the jar, or standing on a chair. (The Health and Safety rep in your school (ours is the custodian) could come for a brief visit to talk to the children to explain the dangers of the last method.)

- Tell students that they are now going to choose one of the doable options (a "can do now" solution) and build and test the device to see if it will solve the problem of reaching the jar. (We suggest because of the age of the students that you direct them all to select the same solution - building stilts.)

EXTEND:

- Allow students time to try to create the stilts (individually or in pairs).
- Share with them the different materials available for building. Encourage students to plan out their design before building. Have them consider: What materials are strong enough to support their mass? What adhesives work best to join the materials together?
- Students may need to try out the different materials and adhesion methods (especially if they are unfamiliar with these items).

IMPORTANT SAFETY NOTE: BE SURE THAT AN ADULT (PARENT VOLUNTEER, OLDER STUDENT, ETC.) IS STANDING NEARBY WHEN THE STUDENTS TRY TO USE THEIR DEVICES TO PREVENT FALLS/FALLING OBJECTS.

- Students should have an opportunity to share their devices with each other. They should explain why they picked certain materials to help them achieve their goals. They will need to practice using the word 'because'. They will also need to explain/justify their use of adhesive materials. How do these things help them to reach the high snack jar? How do they know these things are the right choices? Are there other materials that would be better suited?

EVALUATE:

Diagnostic:

- Activate and assess prior knowledge by having the class participate in an activity called "Milling to Music". Have students spread out within a designated area. Put on a CD and ask students to move slowly and carefully around the room/area. When the music stops, have students face the closest person (allow some time for this), and discuss the answer to a question posed by the teacher. Once both partners have had a chance to share, they stand back-to-back. The music goes on again, the activity is repeated with a new question. Possible questions include:
  - What are different ways to join materials (pieces of paper, wood, fabric, etc.)?
  - What are different ways to make something stronger (e.g., tower made out of blocks, cardboard bridge suspended between 2 chairs)?
  - Think about a time that you tried to build something - an object or device of some sort (e.g., using blocks, legos, cardboard, sand, snow). What did you build? Why did you want to build it?
  - Did you have to make changes (modify) your device? What did you do and why?
  - If you were able to build that same device again, what would you do differently this time?
- Have a few students share their reasoning for some of the sample statements as a large group.

Formative:

- The teacher should review and respond to the work of each student as they progress through the lesson. (Use TM-4: Skills Continuum Stages 1 & 2 (DRAFT) as reference for development of skills across the grades.)
- The teacher will observe and gather anecdotal evidence of student understanding of the technological problem-solving process.
- Conference with students at the end of the project about how they used tools, fasteners and materials, how they carried out their plan and have students evaluate their device that they built. Possible conference questions could include:
  - Were you able to build your device exactly as planned? Why or why not?
  - Did the process of building the device change your mind about what you "can do now"?
  - If you had it to do over again, what would you change? Why?

BACKGROUND INFORMATION:

The technological design process has students identify a problem or need, design a solution, implement a solution, evaluate a product or design, and communicate the design process. Students should be given many opportunities to design and make things using a variety of materials and simple tools.

Generally children design and build based on their first idea with little testing. Students must be encouraged to reflect on their designs. Try not to judge student designs as "good" and "bad" or "possible" and "impossible." Using terminology such as "can do now" and "can't do now", reminds students of the purpose of the activity to design something that they can safely make within the space and time allotted, using available materials.

Domes are excellent shapes for stilts. When force is applied to the top of the dome, the dome distributes the force evenly along the sides in every direction. Thus, even a small yoghurt container can support the weight of a child.

LOOK FORS:

1. Children will conduct simple investigations about the nature of the materials needed to construct the stilts, including the ability to weight bear the mass of the child.
2. Children will demonstrate safe use of all materials and tools used in class.
3. Children will solve problems while designing and constructing their stilts.
4. Children will investigate and discuss how familiar objects are designed to meet a human need (reaching the cookie jar!)

Students are:

- beginning to recognize a practical problem in immediate environment (e.g., unable to reach a cookie jar) (STAGE 1 Skill)
- brainstorming with the class possible solutions to a practical problem, and reach consensus on a solution to implement (STAGE 2 SKILL)
- developing with the class a plan to solve the practical problem (identify simple steps to follow) (STAGE 2 Skill)
- developing as a class, limited criteria to evaluate an object or device based on its function (STAGE 3 Skill)
- identify materials to be used (STAGE 2 Skill)
- follow a simple plan / procedure developed by the teacher, to solve a practical problem (STAGE 2 Skill)
- with guidance, use appropriate equipment to measure, construct and test simple models and devices (STAGE 2 Skill)
- with guidance, records and organizes information and results using drawings, simple tables (e.g., tally), graphs and/or words (STAGE 2 Skill)

SEQUENCE (where in the unit does this lesson best fit?):
This lesson is best taught at a point in the year when the children are able to share their ideas verbally with the group, as well as have an understanding of the expectation to use scientific vocabulary. Knowing how to clean up as well as safe procedures with the various tools (i.e. scissors, glue, tacks, etc.) will also be important. This is an excellent opportunity to teach the concept/skill of labeled diagrams.

TEACHING STRATEGIES:
Milling to Music
Think Pair Share
Brainstorming (with sticky notes)
Large group discussion
Individual/Partner sharing

SAFETY:
1. Children will need to be supervised and/or supported to poke the holes in the margarine tubs or yoghurt containers.
2. Children will require supervision when they attempt to walk on their stilts to reduce the risks of falling.

**The stilts should be tried out in an area that is free from objects that could hinder easy walking or that could injure the child during a fall. We suggest the gym, an open carpet area, or the hallway.

BLACK LINE MASTER[S]:

TEXT REFERENCES:

Read Aloud / Shared Reading:

Guided Reading / Independent Reading:

Science & Technology Curriculum Expectations:
ks10 select and use materials to carry out their own explorations (e.g., initially: select specific materials to build something; eventually: propose changes to the plan when prompted by the teacher), and communicate their intentions
ks16 demonstrate an awareness of the safe use of all materials and tools used in class (e.g., walk when carrying scissors, wear goggles at the technology centre, clean up spilled water with a sponge or mop)
ks18 investigate and use familiar technological items (e.g., different wheeled vehicles, a CD player or computer, a hammer and nails, a calculator, a variety of scoops at the sand table), and describe their use in daily life

ks19 solve problems while designing and constructing things, using a range of tools, materials, and techniques (e.g., build a house for toy people with found materials; build a tower with boxes of different sizes; design and build a bird feeder using recycled materials)
ks20 investigate and discuss how familiar objects are designed to meet a human need (e.g., buttons for fastening clothes, shoes for walking, bandages for protecting cuts, wheels for moving things)

Mathematics Curriculum Connections:

Math/Measurement: How tall is the shelf? How tall are the students? How tall will the students be when they are standing on their stilts?

Math/Geometry: What are the shapes of the containers? Which shape is the strongest? Which shape is the weakest?

Language Curriculum Connections:

Reading: Write the names of the various shapes onto card stock and label the shapes with their names. Practice saying and reading the names.

Media Literacy: Practice reading a labeled diagram. As a class, create a labeled diagram, with removable labels. Play a 'pin the label on the diagram' game.