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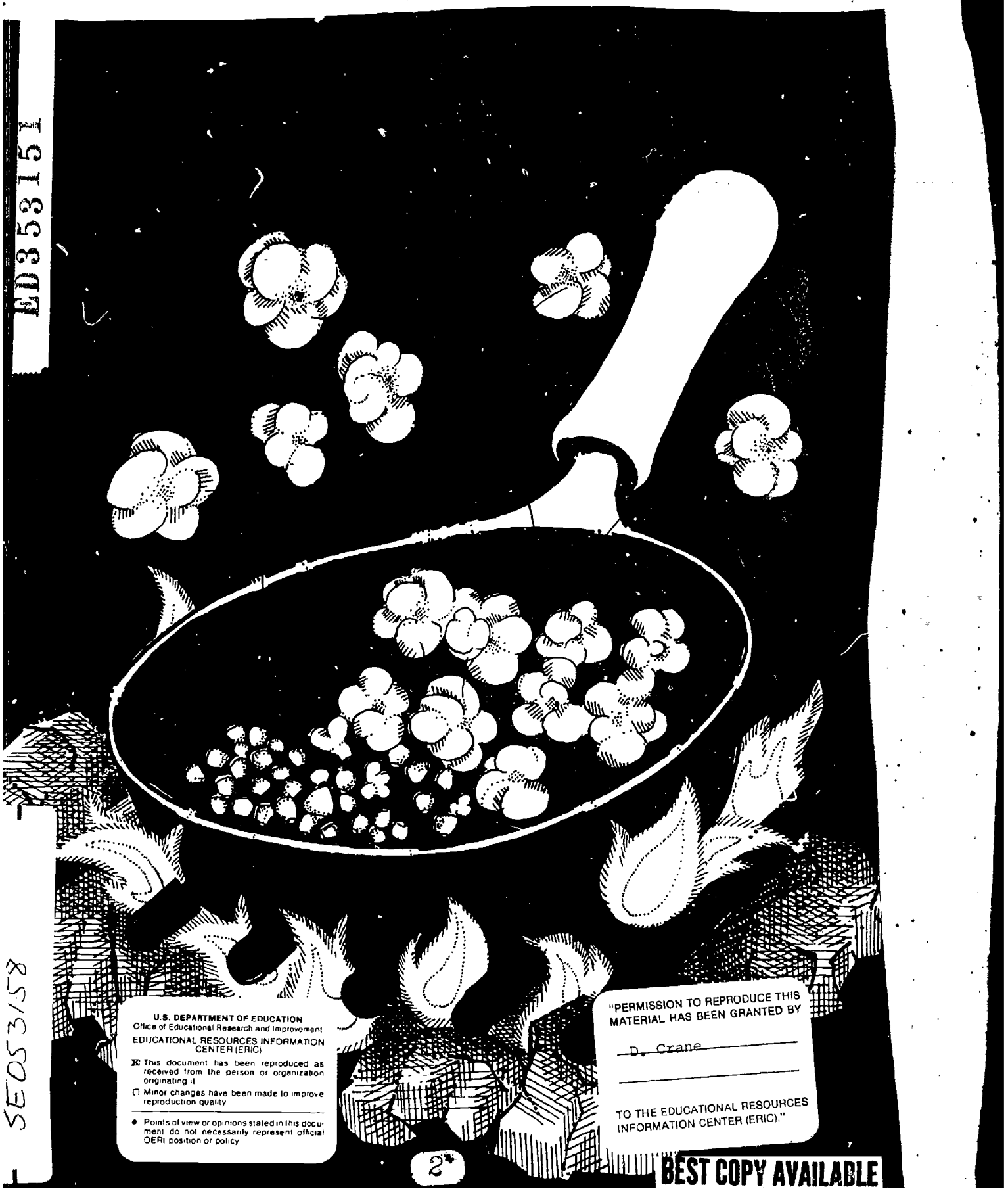
ABSTRACT

One of the basic principles of the Language Development Approach is that students must learn the language necessary to understand, talk, and write about all subject areas in order to succeed in school. This book contains information about teaching primary school science in the Northwest Territories with lessons that emphasize language. The goals of the unit are to (1) develop student language proficiency; (2) provide opportunities for students to use language in many different situations and for many different purposes; (3) develop student listening, speaking, reading, writing, and thinking skills including the science process skills; and (4) expand student knowledge of the science concepts related to popcorn, matter, and energy. Following a section on resources (background information on popcorn, resources included with this unit--patterns and worksheet, and related English materials--magazines, lists of children's books about popcorn, teacher's resources, films, etc.), lesson plans on three topics (properties of a solid, changes in properties of solids, and popcorn is a solid) are presented. Activity ideas for science/social studies, mathematics, language arts, music/poems/stories, art, physical education/movement, and special activities are suggested. Each lesson plan contains the following segments--exercises or activities: science concepts, English vocabulary, English sentence patterns, English language concepts, special materials required, concept development/language exposure, language practice, and application. Poems, songs, and stories on this subject conclude the guide. The lessons are appropriate for students whose first language is English as well as for students who are learning English as a second language. (PR/CW)



Popcorn

A Language Development Unit for Science Matter and Energy

Grade One

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SCHOOL PROGRAMS
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FOREWORD

Parents, educators, and students themselves all recognize the importance of language in the school curriculum. In order to have appropriate language programming, students need to have their experiences, skills, knowledge and, particularly, the language they bring to school identified and used as the basis for the program. Language programs should begin with and build upon these strengths. Where a child is dominant in a language other than English, he should be taught in that language. In many communities in the N.W.T., that means that the language of instruction should be Inuktitut or one of the Dene languages. Students in these communities need to gradually learn English as a second language. In instances where students speak a dialect of English upon school entry, the school's role is to respect and make use of the language the students bring. The school program should also help those students extend their English proficiency by learning the language used in varied communication situations and the language necessary for success with the academic curriculum. The aim of language instruction, where applicable and where possible, is to produce bilingual students.

Successful bilingual education requires good teaching in both languages. For many years northern educators have wrestled with the difficulties of teaching English with inappropriate commercial materials from the south. Teachers have been requesting assistance with how to most efficiently and effectively teach English as a second language/dialect. The Department of Education has determined that the Language Development Approach is the most suitable way to meet the needs of ESL/D students. The Department has developed these units for teachers to use in their classrooms. The Department therefore expects teachers to implement these units unless they can identify and justify to their Superintendent something more appropriate for their students.

Eric Colbourne
Assistant Deputy Minister
Schools Branch

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Special acknowledgement is made to Wendy Stephenson who developed some of the activity ideas and the original poems, songs and stories upon which this unit is based.

A special note of thanks to Corlis Robinson for her patience and diligence in typing and retyping the unit.

The late Bonnie Pugh and Cathy McGregor adapted Jim MacDiarmid's Language Development framework which forms the structure for each lesson.

Refining the format of and brainstorming activity ideas for the Language Development units involved the assistance of many northern educators. Members of the Teacher Committee who helped develop and pilot sample units included:

Paula Stein	Brenda Petersen	Cathy (Baugh) Fair
Kathy Zozula	Bea Warren	Edna Elias
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Sister Mary Edward Recoskie	Sister Mary Diane Cahill	

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Troubadour Records Ltd. for "Popcorn" by D. Pike, Bonnie Simpson from the album The Corner Grocery Store. © 1979 Homeland Publishing.

Table of Contents

LANGUAGE DEVELOPMENT/SCIENCE UNITS

SCIENCE THEME	GRADE/YEAR		
	1	2	3
LIFE AND THE ENVIRONMENT*	- - - - - - - - - LIVING/NON-LIVING THINGS - - - - - - - - -		
	Arctic/Sub-Arctic Land Animals	Birds	Marine Mammals (Whales)
	- - - - - - - - - - - - - PLANTS - - - - - - - - - - - - -		
	- - - - - - - - - - - - POPULATIONS - - - - - - - - - - - -		
	Bears/ Polar Bears	Dinosaurs	Fish
MATTER AND ENERGY	**Popcorn**	Magnets	Water
	- - - - - - - ENERGY and ENERGY CONSERVATION - - - - - - -		
EARTH, SPACE AND TIME **	- - - - - - - - - - SUN, MOON AND SHADOWS - - - - - - - - -		
	- - - - - - - - - - AIR AND AIR PRESSURE - - - - - - - - -		

* Other animals are covered under Social Studies topics: Fall, Winter and Spring.

Moose/Caribou	Seals
Beaver/Muskrat	Other fur-bearing animals
Rabbits	

** Weather will be covered in a Science/Social Studies/Math unit.

Topic A - Properties of a Solid

1. What is a solid?

Topic B - Changes in Properties of Solids

1. How can changes occur in the properties of a solid?
2. Do all changes occur in a regular pattern?
3. Can all changes be reversed?
4. Do all changes occur at the same rate?

Topic C - Popcorn is a Solid

1. What are the properties of popcorn?
2. How does popcorn change when heat is added?
3. Do these changes occur in a regular pattern?
4. Can these changes be reversed?

UNIT OVERVIEW: GENERAL CONCEPTS

POPCORN

HOW TO TEACH THE "POPCORN" UNIT

How does the topic "Popcorn" relate to the science program?

The Elementary Science Program (1-3 and 4-6, 1986) contains several themes which include concepts related to matter. The following chart shows how the topics outlined on the General Concepts/Unit Overview sheet and the lessons in this unit relate to the concepts suggested in the program guide.

Primary Science Guide	Unit
1.3 Properties of Materials and Change	
1. Objects (solids) can be distinguished by physical properties such as colour, size, mass and shape.	Lesson: Properties of Objects Lesson: Popcorn is _____
2. Objects (solids) differ in their texture, hardness and relative weight.	Lesson: What is a Solid?
3. Change occurs where the properties of objects (matter) are modified.	Lesson: Solids Can Change Lesson: How Popcorn Changes
4. Changes in properties of objects (solids) can occur when water is added to some objects.	Lesson: Solids Can Change
5. Changes in properties of objects (solids) can occur when the objects are heated or cooled.	Lesson: Solids Can Change Lesson: Making Popcorn Lesson: How Does Heat Affect Popcorn? Lesson: How Popcorn Changes
6. Some changes occur in a regular pattern and can be ordered.	Lesson: Solids Can Change Lesson: Making Popcorn
7. Some changes are more easily reversed than others.	Lesson: Solids Can Change Lesson: How Popcorn Changes
8. Some changes occur slowly and others rapidly.	Lesson: Solids Can Change Lesson: How Does Heat Affect Popcorn?
2.2 Properties of Matter	
3. Solids have distinct properties:	
a) ability to retain their shape, can be stacked b) can be poured only if in small pieces	Lesson: What is a Solid?

Using the topic "Popcorn" as an organizing theme, this unit thus translates the concepts from the Science program guide into a set of teaching lessons. As you can see from the chart that outlines all the Science units for grades one through three, other units introduce and reinforce the concepts related to matter.

What part of my program is this unit?

One of the basic principles of the Language Development Approach is that students must learn the language necessary to understand, talk and write about all subject areas in order to succeed in school. Most of the material in the "Popcorn" unit is related primarily to Science; it is therefore part of your Science program. It also contains lessons which emphasize language and concepts from other subject areas. At the beginning of each lesson is a statement which indicates which subject area that lesson emphasizes. You can teach the Literature lessons during Language Arts periods or during Science, whichever you prefer.

What are the goals of this unit?

The goals of this unit include:

- developing students' language proficiency. The purpose is to increase their storehouse of language items and meanings (vocabulary) and to build their intuitive knowledge of structures (sentence patterns). The intent is not to have students study how the language works or to analyze it.
- providing opportunities for students to use language in many different situations and for many different purposes.
- developing students' listening, speaking, reading, writing, and thinking skills. The thinking skills developed include the scientific process skills described in the science program guide.
- expanding students' knowledge of the science concepts related to the "Popcorn" topic.

What grade level is this unit?

Schools throughout the N.W.T. have different ways of organizing students into classes. There are classrooms which consist of only one grade, while others combine two or even three grades. Small schools sometimes have to put primary and

intermediate students together. Regardless of the grade level(s), students in each class will have a variety of levels of proficiency in English.

It is difficult to present a unit which teachers can use easily in all these different situations. The chart which outlines Science topics for grades one to three lists this unit under Grade One. You will find, however, that the unit contains a variety of language items, sentence patterns and activity ideas. Some of the concepts and some of the language activities in the lessons are more suitable for older students. This was done to accommodate the range of abilities which exist even in classes which are supposed to be one grade level and also for those teachers who have multi-grade classrooms and want to teach the same unit to the whole class.

What else do I need to know before I teach this unit?

It is important to understand the Language Development Approach which forms the basis of this unit and the Language Development Framework which forms the structure of each lesson. Please read the explanation of them which follows this section. It introduces the parts of each lesson and explains their purpose. Once you have read the description several times and taught a few lessons you probably will not have to read it for every unit.

How long should I spend on this unit?

The length of time you spend on each lesson and on the unit as a whole will depend in part upon what your students already know about the concept/topic and how interested they are in it. As with any unit you teach, however, the success of this unit will depend largely upon your interest in and enthusiasm about the topic. If you make the lessons stimulating to students, they will want to spend more time on the unit.

In general, it is more important to cover a few concepts well and ensure that students incorporate the language items for those concepts into their language repertoires than to cover everything in the unit. If students begin to lose interest in the topic, wind up what you are doing and start a new unit.

Which lessons do I teach?

This unit includes a number of lessons. As the person who knows your students and their needs best, you must decide which lessons are appropriate for your students and which are not. You may decide not to teach certain lessons because:

- students already know the concept and the language covered
- students are not interested in that aspect of the topic
- the language is too difficult or is not appropriate
- the concepts are too difficult or are not appropriate

The initial assessment activity will help you identify which concepts and vocabulary students already know and therefore which lessons you can skip and which are more appropriate for you to teach. You might also want to check the students' cumulative files and/or discuss with other teachers which topics students have already covered. It is important to keep a record of which lessons you teach so that other teachers will not repeat that material in future years.

In what order should I teach the lessons?

You can teach the lessons in the order in which they appear in the unit or you can teach them in any order you think is appropriate for your students. Generally, the Science lesson for a topic should precede (or be taught at the same time as) the Language Arts lesson for that topic. The Language Arts lesson uses poetry or literature to reinforce the concepts taught during Science.

How do I adjust these lessons to meet the particular needs of my students?

The lessons in this unit are SAMPLE lessons. They may be used in classrooms where English is the first language of students (and they are very proficient), where students speak a dialect of English, or where English is a second language for students who come to school proficient in an aboriginal language. Because of this diversity of linguistic situations it is difficult to design lessons which are equally appropriate in every classroom. These lessons provide an example of the kind of language and activities which are appropriate to teach the concepts related to the topic. You may be able to teach them exactly as they appear here. If you feel some aspect of a lesson is not appropriate for your students however, feel free to adapt it to meet their needs. You may wish to use some of the

activity ideas to make up lessons of your own and use them instead of the ones included. Some of the most common ways in which you might need to adjust the lessons include changing the:

a) amount or type of vocabulary and/or sentence patterns in a lesson. During the initial assessment activity you may find that students have/don't have particular vocabulary items or sentence patterns. You may need to make the language in each lesson simpler or more difficult, depending upon your students' proficiency. You may want to introduce fewer or more vocabulary items or sentence patterns. Students who are more proficient need to concentrate on vocabulary; you may want to omit all sentence patterns for them.

b) number of listening and speaking activities. Students who speak little or no English or who are not familiar with a topic require extensive aural/oral practice. This is particularly true of primary ESL students. You may want to delete reading and writing activities altogether for such students and substitute more listening and speaking activities. Students who are having difficulty speaking need more listening practice so you may want to increase the emphasis on listening. Students who are more proficient do not need as much listening and speaking practice; they can do more reading and writing activities.

c) kinds of activities suggested for listening, speaking, reading, and writing. Your students' ages, interests, abilities, needs, and language proficiency influence the kinds of activities you choose for them. Students with limited proficiency require more controlled Language Practice activities. Students who are more proficient can handle more open-ended activities. Your preferred teaching style and the materials and equipment available to you also affect your planning. You may want to change some of the activities to make them more suitable for your students. You may have to change others because you do not have the necessary resources.

d) sequence of activities suggested. Each lesson contains all three phases of the Language Development Framework: Concept Development/Language Exposure, Language Practice, and Application. It is important to include all three phases in your teaching. However, you may want to alter the sequence in which you do the activities <u>within</u> each phase. For example, in the Language

Practice phase listening and speaking activities always precede reading and writing activities. Usually it is important to develop aural/oral skills before introducing/developing literacy skills. However, if you have older students who are more proficient in reading and writing you may have to combine those activities with listening and speaking to keep students interested and involved. This is not as likely for primary students; they require simple physical actions to help focus their attention and energy during listening and speaking activities.

e) content used to teach the concept in each lesson. These units have been developed for use throughout the N.W.T. in various cultural and linguistic situations. It is difficult, therefore, to be as culturally specific in the lessons as desirable. As you plan your lessons, you must be as sensitive as possible to the cultural values, experiences, and lifestyles of your students. Please make the lessons as relevant to your community and your students as possible. If you think anything might be offensive to parents or students in your community please omit it or substitute more appropriate content. If in doubt, ask! LEA members, classroom assistants, and parents can provide suitable alternatives. If you are teaching any of the lessons in an aboriginal language, you probably will need to change much of the specific content in those lessons.

f) language in which you teach the lesson. If you teach in a classroom in which an aboriginal language is the language of instruction and English is taught as a second language you will want to teach some of the lessons in each language. For students who are just learning to speak English, the language in some of the lessons is too difficult. Teach those lessons in the aboriginal language. In such situations, consider teaching the lessons as follows:

ABORIGINAL LANGUAGE (during Science)	ENGLISH (during ESL)
Properties of Objects	Making Popcorn
What is a Solid?	Popcorn is _____
Solids Can Change	How Popcorn Changes
	How Does Heat Affect Popcorn

If you teach in a classroom in which English is the language of instruction, you will teach all of the lessons in English. In such situations, you might teach some lessons during your Science and Social Studies periods and others during your Language Arts periods. If your students are not very proficient in English you may want to omit some lessons altogether.

How do I group students?

These lessons have been designed so that you can teach one lesson to the whole class. You can do Concept Development activities with everyone in most instances. Then you can group students for Language Practice activities according to their needs and abilities. Students who require listening and speaking practice can work with the teacher, a classroom assistant, a tape recorder, or a language master while other students do related reading and writing activities. In this way you can work with the whole class on the same lesson, but students can perform at their own individual skill levels.

Sometimes you may want to group students and teach each group a different lesson. You could organize these groups in two ways:

1) include students with different levels of proficiency in each group. The students who are more proficient serve as models for less proficient students. Teach each group a lesson from a different topic and have students share their work with each other.

2) include students with similar proficiency levels in each group. Teach each group a lesson using material at its proficiency level.

What kind of preparation do I need to do before teaching a lesson?

First of all, you should read over the lesson so that you are familiar with it and with the materials you require to teach the lesson.

Secondly, you should make sure you have all your materials ready, even if it means delaying the introduction of a unit or lesson for several days. This includes

whatever resources you require for the Concept Development activities, as well as Language Practice materials: vocabulary cards, pictures, sentence strips, etc.

Initially it may seem as if there is a lot of preparation for each lesson, but one lesson may take several days to teach and most lessons use the same materials over and over again in different ways. Students in small groups use many of the materials from Concept Development activities during Language Practice. If you work in a school where more than one teacher is using the units, perhaps you can share the preparation work required. Older students often enjoy making things like sentence strips after school as well. Once you have made the materials for one lesson, be sure to save them for another teacher or another year! Plastic envelopes have been provided to help you keep all the materials for one unit together.

How do I schedule a lesson on my timetable?

Because the lessons emphasize language related to different subject areas, you may want to teach them during various subject periods. This means you may be working on two or three lessons at the same time, each during a different subject. Since the lessons all focus on the same theme, language and concepts emphasized during one period will reinforce those learned during another. It also means that you would be combining the normal times allocated each week for Science and Social Studies to teach this Science unit for three weeks or a month. You would then switch to a Social Studies unit for several weeks using both time periods.

As you plan, keep in mind that one lesson is not necessarily equivalent to one day's work. You will require several days to cover most lessons. You need this amount of time to make certain students internalize new concepts and language items. The chart below shows how you might teach the lesson "Popcorn is _____" during your Science period over a week.

Note that the Concept Development activities are spread over several days. This helps reinforce both concepts and language and gives students who miss one day's lesson other opportunities to be exposed to the material. Note also that listening and speaking activities precede reading and writing so that students are very familiar with the language orally/aurally before they work with it in print.

Key

(L) = Listening activity
(S) = Speaking activity
(R) = Reading activity
(W) = Writing activity

LESSON: POPCORN IS _____

	Monday	Tuesday	Wednesday	Thursday	Friday
Concept Development	#1a	#1b	#1b	#2	
Language Practice	#1 L	#2 L #3 L/S #4 L/S	#5 L/S #6 L/S/R #7 L/S/R	#8 R #9a S/R #9b R/W #9c W	
Application	#1a	#1b			#2 #3

How do I evaluate student progress in this unit?

Initial Assessment

The initial assessment activity which you do with the students before any of the lessons will help you determine which concepts and language students already know and which they need to learn.

Ongoing Assessment

It is important to continue assessing students' success in mastering language items, skills and concepts throughout the unit. Each phase of the framework provides opportunities for assessment. During the Concept Development/Language Exposure activities you can informally assess students' understanding of new concepts through observation. Watch to see which students have difficulty matching new language items with the appropriate objects or meanings. It is important to ensure that all students understand new vocabulary and sentence patterns before starting Language Practice activities.

The nature of the Language Practice activities allows you to assess individual student performance in listening, speaking, reading and writing skills. You can decide which activity to do next based on student performance in the previous

activity. Those students who have difficulty with aural/oral activities require extensive practice before doing reading and writing.

The Application activities have been designed to give you an opportunity to determine how much of the language for that lesson students have learned. You can also determine whether students understand the language and concepts.

In addition to observing students during lesson activities, sometime during the course of the unit each student should have a personal conference with you to review work from various lessons. The one-to-one nature of this meeting allows you to determine more effectively:

1. specific weaknesses and strengths in listening, speaking, reading, writing skills,
2. comprehension of and proficiency using new language items,
3. topics and areas within a topic of particular interest to the student,
4. individual progress with the development of scientific process skills (thinking skills),
5. comprehension of science concepts included in the unit.

For the student this meeting serves as an important opportunity to articulate thoughts and feelings about the topic, share work with an interested adult, and identify future projects and directions. You can use the conference to take an in-depth look at one piece of independent reading/writing, to teach skill lessons needed to support and encourage student efforts, and to determine appropriate activities for future lessons.

Final Assessment

The culminating activities provide further informal assessment opportunities. During these activities students use all the concepts, skills and language they have learned throughout the unit. In addition, you may want to use your own assessment techniques or instruments to determine what students have learned. There are examples of simple evaluation activities at the end of the unit.

What kind of records should I keep for this unit?

You will want to keep records for yourself of individual student's progress and mastery of skills, concepts and language. These records can be a combination of

anecdotal notes based on observations, check lists, formal or informal tests, taped samples of students' speech and reading, and samples of written work.

Students should also be responsible for keeping records of what they have accomplished. They can keep lists (poems they have learned, stories they have read, books they have written), journals, and their own samples of speech, reading and writing.

Finally, it is also important to keep a list for the next teacher of which lessons you have taught and which concepts have been covered in those lessons. Hopefully this will prevent those groans of "We did that last year," or even worse "We've done that every year since grade one!"

You will find more detailed information on evaluation and record keeping forms in the booklet Evaluation Guidelines for the Language Development/Science Units.

INTRODUCTION TO THE LANGUAGE DEVELOPMENT APPROACH

This unit consists of lessons which illustrate how to implement the Language Development Approach in the classroom. In order to use these lessons most effectively, it is important to be familiar with and understand:

a) the principles which form the basis of the approach, and
b) the methodological framework which provides the structure for the lessons and applies the principles to teaching practice.

The following is a brief explanation of the principles and the framework. For a more in-depth discussion of both, refer to the appropriate sections in the Language Development ESL/ESD guide.

PRINCIPLES

The Language Development Approach draws on elements of many approaches to teaching second languages and English language arts and integrates these to form a broad set of principles regarding language teaching. These principles include:

1. **Students need to have their experiences, skills, knowledge and, particularly, the language they bring to school identified and used as the basis for the school language program.** The program should begin with and build on these strengths. Where children are dominant in a language other than English, they should be taught in that language. In many communities in the N.W.T., that means that the language of instruction should be Inuktitut or one of the Dene languages. Such students should gradually learn English as a second language. In instances where students speak a dialect of English upon school entry, the school's role is to respect and make use of the language the students bring, and help them learn the English used in other communication situations and which is necessary for success with the curriculum. The aim of language instruction, where applicable and where possible, is to create bilingual students.

2. **Students need to learn to articulate for themselves and to communicate their thoughts, feelings, needs, opinions and intentions for a variety of purposes in many different communication contexts. They need to be able to understand, learn from and respond to the communication of others.** This involves being able to:

   a) express and inquire about personal needs, desires, feelings;
   b) socialize;
   c) direct;
   *d) express and find out intellectual attitudes;
   *e) impart and seek factual information on past and present experiences;
   *f) reason logically;
   *g) predict;
   *h) project;
   *i) imagine.

   * Success in school depends largely upon the students' abilities to use language in these ways.

3. **ESL/ESD students need to spend more time learning to speak English than they do learning about English.** Until students have an extensive language repertoire, and can use language for a variety of purposes and in many different situations, they are not ready to analyze language. When students have developed an intuitive grasp of how English works, they can begin to study language concepts and how to apply them.

4. **Students need to learn language, but they also use language to learn.** Therefore, language should be taught across the curriculum. Whether students are learning a subject in their first language or in a second language, the development of each student's language skills is essential to achievement in the subject.

5. **Students need to learn language that is meaningful.** It is easier to accomplish this when teaching language in a context. Therefore, all teachers, in all subject areas, must attend to concept development. Without adequate concept development, the language students learn is either vague or devoid of meaning.

6. **Students need to learn to develop their thinking skills and to engage in more abstract levels of thought as they mature.** They must learn the language that allows them to express their thinking about concepts. Initially, they need to

learn concrete vocabulary and functional sentence patterns as they learn to recall, match, sequence, classify, etc., during activities. Eventually they need to learn more abstract terms and more complex sentence patterns as they grow in their ability to think more abstractly: generalizing, analyzing, imagining, predicting, and evaluating.

7. **Students need to participate in language activities that integrate the language strands of listening, speaking, reading, and writing.** When these strands are taught in isolation from each other in the guise of subjects such as spelling, phonics, grammar, reading, etc., student learning becomes fragmented. Students have difficulty understanding the relationships among listening, speaking, reading, and writing and lose the benefit of one or more strands preparing for and/or reinforcing growth in another e.g., discussion and brainstorming which involve listening and speaking prepare students for writing. First and second language programs should therefore integrate listening, speaking, reading, and writing skills. Specific skills taught will vary with the proficiency level of the students. In the initial stages reading and writing activities should use only language which students have internalized already through aural/oral work. Strong oral proficiency is a prerequisite to learning to read.

   a) Successful readers rely on three language cue systems:

      - grapho-phonemic
      - semantic-associational
      - syntactic

      The ability to use the latter two systems is a function of oral language proficiency. The greater the oral proficiency or degree of internalized language of the students in either their first or second language, the more able they are to use the latter two systems. Reading instruction should not emphasize the use of the grapho-phonemic system to the exclusion of the semantic associational and syntactic systems.

   b) Successful writers also rely on three cue systems. They must possess a meaning base on which to draw, a storehouse of vocabulary representing the meaning base (semantic-associational), and an intuitive sense of how the English linguistic system works (syntactic). Mechanical skills

(grapho-phonemic) are just the tools which enable students to communicate knowledge more effectively.

8. **Students need to learn "real" language and how to use it in the natural situations in which it is required.** The vocabulary items and sentence patterns used in lessons should be as similar as possible to the everyday language people actually use. Students require opportunities to practice the language by interacting with others. They will not learn to use language effectively solely through individual paper and pencil exercises.

Program content, classroom organization and teaching techniques used to develop concepts and language and skills should:

a) reflect all of the above, and
b) vary according to:

- the language proficiency of the students in the first and second language,
- cultural background (experiences, interests, and cognitive abilities),
- age/grade levels,
- type of topic,
- learning style of students,
- materials and equipment available,
- teaching style of teacher.

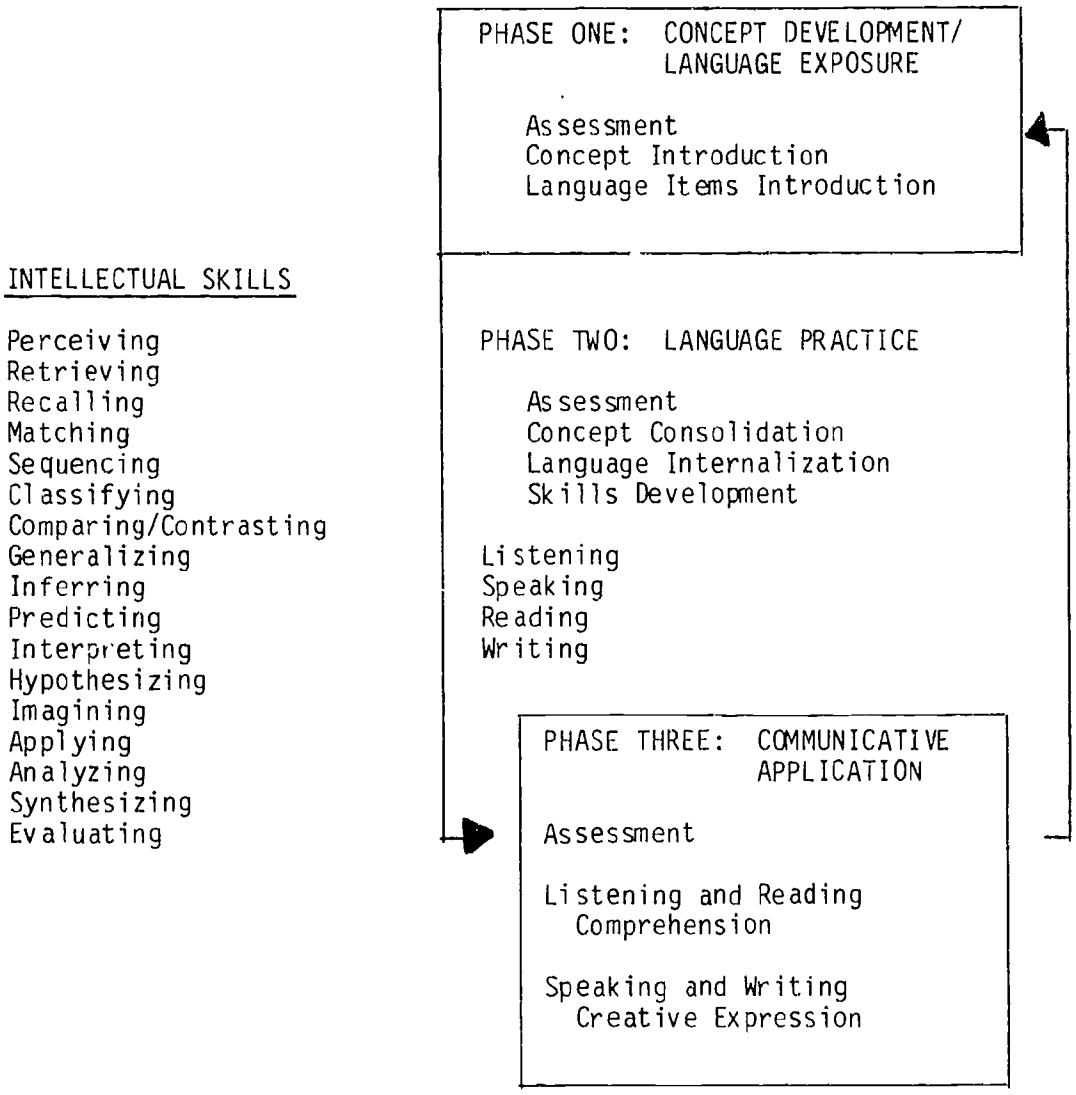
FRAMEWORK

The Language Development Approach uses the following framework to structure lessons involving language learning and conceptual development for all subject areas or for any topics of personal or cultural relevance and interest. The framework consists of three phases:

Phase One: Concept Development/Language Exposure
Phase Two: Language Practice
Phase Three: Communicative Application

LANGUAGE DEVELOPMENT FRAMEWORK

(Based on the work of Jim MacDiarmid
Adapted by B. Pugh and C. McGregor)



Phase One: Concept Development/Language Exposure

At the beginning of this phase, it is important to assess what conceptual and linguistic knowledge students already possess for a topic. This assessment establishes the appropriate starting point for instruction and helps determine which concepts, experiences, and language items to emphasize.

During this phase, students participate in meaningful activities or experiences through which they learn new concepts related to the topic of study. As much as possible, these activities should involve direct, firsthand, active learning with concrete materials. Where necessary, e.g., in a unit on space, indirect or analogous experiences (films, filmstrips) allow students to move beyond the confines of the immediate classroom to explore concepts associated with other times and places. These activities and experiences help students build bridges between what they already know and new concepts.

While they carry out the concept development activities, students hear and use the new language items that express the concepts. They learn to associate new vocabulary with the relevant objects or actions and to express the relationships among concepts with appropriate sentence patterns. It is essential that students learn the meaning of all new language items during this part of the lesson.

You may choose to use the students' first language during this phase when students have little or no English. You can conduct the assessment tasks in their first language to determine the extent of their conceptual knowledge. If the concepts are familiar, concentrate in ESL classes on teaching the related English language items. If the concepts are new, teach them to students in their first language and then introduce English language items. In classrooms where English is the language of instruction, have the Classroom Assistant explain difficult concepts in the students' first language to be sure they understand them.

Phase Two: Language Practice

In Phase Two, students use the new language items introduced in Phase One in a variety of activities that develop listening, speaking, reading, and writing skills. Through intensive practice of items in a variety of ways, students come to "own" the new language, i.e., commit it to memory so that it becomes part of

their permanent storehouse of language items. These activities also continue to strengthen the bond developed in Phase One between the new concepts and the language items that represent those concepts. While the whole class may participate in most of the Phase One activities, it is important to group students for language practice according to their language skills and needs. For students who are not proficient in English, use only language items that they are comfortable with aurally/orally in reading and writing activities.

Phase Three: Communicative Application

The final phase of the lesson sequence provides opportunities for students to use their acquired knowledge and language to communicate in a variety of situations. Students show they have understood the new concepts and can use the new language items as they interact with others. These activities involve students in listening, speaking, reading, and writing to solve problems, bridge an information gap, share information, complete a task, develop an arts and crafts project, share a finished product and explore related concepts and language. While carrying out these activities, the teacher can work individually with students to assess the extent to which they have mastered the concepts and language from the lesson.

In addition to the communicative application activities for each lesson, there are culminating activities at the end of each unit which provide opportunities for students to use all the concepts and language they have learned throughout the unit. During these activities the teacher can meet with students to review their work and what they have learned during the unit.

Intellectual Skills

An essential component of the framework is the development of intellectual skills. Learning new concepts and language involves thinking skills. On the other hand, the ability to think abstractly involves conceptual and linguistic knowledge.

Students who lack the prerequisite basic experiential and linguistic knowledge for a topic cannot engage in activities that require them to apply or solve problems

using that knowledge. In moving towards abstract levels of thinking students must:

- acquire simple and concrete concepts and the corresponding labels,
- see patterns and relationships among concepts and form progressively larger and more inclusive conceptual networks in the form of principles and generalizations,
- apply the principles and generalizations to new situations, and
- analyze, synthesize, and evaluate old and new knowledge to solve problems.

In the Concept Development/Language Exposure phase, assessment activities establish whether or not students have basic building block concepts and language to engage in more abstract thinking about a topic. Subsequent activities fill gaps and/or extend the students' background. The structured nature of Language Practice activities demands less high level intellectual activity. Answers are more convergent in nature; the information readily provided or available. However, Communicative Application activities require divergent thinking. Students draw on what they already have learned during the previous two phases to bridge an information gap or solve a problem.

USING THE FRAMEWORK

The Language Development Framework:

- helps students acquire a conceptual background about a topic
- helps students acquire language to express their knowledge about that topic
- provides opportunities for students to use their knowledge and related language in a variety of situations and
- provides opportunities for students to engage in higher levels of thinking.

The framework forms the basis for the following lessons. Keep in mind that the techniques and activities you use with students depend upon many factors:

- cultural background of students
- learning style of students
- age level of students
- proficiency in English
- type of topic
- materials and equipment available, and
- preferred teaching style of teacher.

RESOURCES: BACKGROUND INFORMATION ON POPCORN

What Makes Popcorn Pop?

The inside of each hard kernel of popcorn contains moisture. As the kernel heats up, the moisture turns to steam. The hard shell holds the steam inside as the pressure builds until suddenly the shell bursts. The kernel then turns inside out and puffs up.

RESOURCES: INCLUDED WITH THIS UNIT

Patterns for popcorn, popcorn box

Popcorn worksheet

RESOURCES: RELATED ENGLISH MATERIALS

Magazines

Ranger Rick, Volume 11, Number 1, January 1977

National Geographic World, December 1979

Teacher, October 1979

Teachers' Resources

Recipes, information on popcorn may be obtained from:

The Popcorn Institute
111 East Wacker Drive
Chicago, Illinois
60601

Popcorn unit:

The Mailbox (Jan/Feb 1987)
The Education Centre, Inc.

Films, Filmstrips and Slides

Children's Books

The Popcorn Book
Tomie de Paola
Scholastic Book Services, 1978

Popcorn
Millicent E. Selsam
William Morrow & Co., n.d.

What Makes Popcorn Pop?
Dave Woodside
Atheneum Books, 1980

Tick, Tock, the Popcorn Clock
Jane B. Monroe
Child's World, 1978

Peanuts, Popcorn, Ice Cream, Candy, Soda Pop & How They Began
Russell and Solveig Paulson
Abingdon Press, n.d.

The Popcorn Man - A One Act Musical Play for Children
Robb & Patterson
New Press, 1972

"How Things Work" (Vol. 8)
"Make and Do" (Vol. 9)
"Scientists and Inventors" (Vol. 11)
From: Childcraft
Field Enterprises Corp., 1968

Popcorn Days & Buttermilk Nights
Gary Paulsen
Lodestar Books, 1983

The Golden Flute
(poems #3, #81)
Hubbara and Babbitt
John Day, 1932

The Popcorn Dragon
Jane Thayer

"Mr. Picklepaw's Popcorn"
From: Rewards
Houghton-Mifflin Co., 1971

Miscellaneous

Artsplay (Book & record - includes "Popcorn Music" and movement activity)
L. Burton and K. Kuroda
Addison-Wesley Publishing Company, Inc., 1981

"Popcorn"
From the record We All Live Together
Greg Scelsa and Steve Millang
Youngheart Records

RESOURCES: RELATED ABORIGINAL LANGUAGE MATERIALS

INITIAL ASSESSMENT ACTIVITIES

The following activities should be done before you teach any of the lessons. They will assist you to determine:

1. what students already know about the concepts of the topic and therefore where instruction should begin;

2. what interests students have in the topic and therefore the direction the unit should take; and

3. what language students already have to discuss the topic and what language they require.

One of the basic principles of the Language Development Approach and of all good teaching is that you should start with the student when planning and carrying out a unit. Before you begin to teach it is important to assess your students' knowledge of and interest in the topic. You should determine what students already know about the topic/concepts you intend to cover. What ideas do students already have? What misconceptions do they have which you must address? What gaps are there in their knowledge which require that you teach certain lessons? What concepts do they know well enough so that you can skip the lessons which teach those concepts? What questions do they have? What relationships do they see between different aspects of the topic?

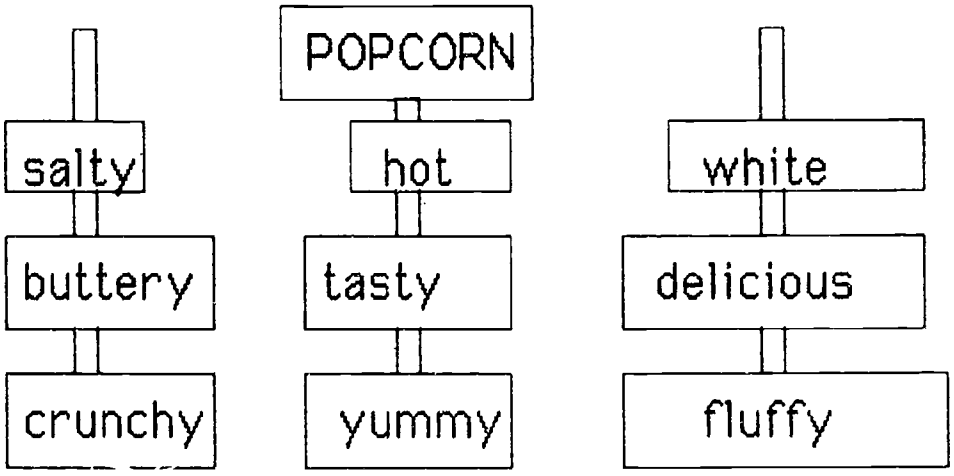
It is also important to identify what experiences students have which relate to the topic/concepts. By identifying these and building upon them in the lessons you can help students relate the new ideas and information to their own lives. It is important to do this because it assists students to internalize new concepts. It helps students make the concepts part of the conceptual framework which they use to understand and describe their world. If they do not have concrete, firsthand experiences to relate to each concept you will have to provide them wherever possible.

Another use for these activities is to help you identify particular interests of individuals, groups of students or the whole class. You can then include activities in the lessons which involve student interests, thereby increasing motivation for them to participate and learn. You may decide to add, substitute or omit some lessons because of students' interests.

These activities will also help you determine what language students have to discuss the topic. You can find out what vocabulary items students already know and what associations they have for each word. It is important to ascertain the meanings students attach to words; sometimes their interpretations may surprise you! If they do not clearly understand terms or use them incorrectly, it will prevent them from understanding and incorporating the concept into their mental framework.

1. Brainstorming

Look at a bag of unpopped corn and a bowl of popped corn. Ask students to tell you what they know about popcorn. Record their answers on cards and hang them on masking tape strips (sticky surface up) which you fasten to the wall or the chalkboard.



If students have difficulty with this activity you may wish to direct their tninking or prompt ideas by asking more specific questions:

"Where do we get popcorn?
What words do you think of when I say 'popcorn'?"
Etc.

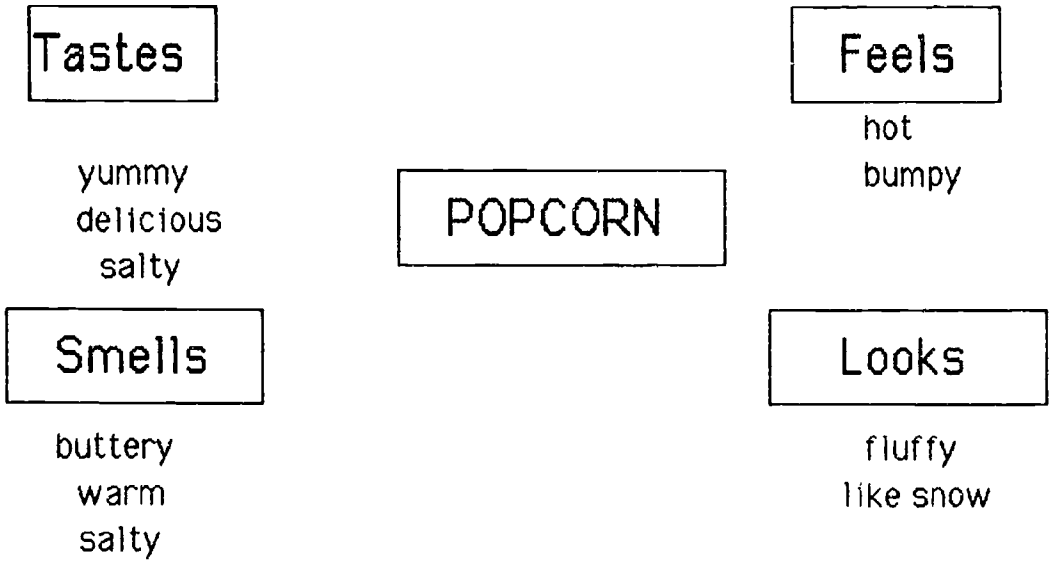
Encourage students to predict answers to these questions even if they aren't sure of the exact responses. It might be interesting to record their predictions separately and compare them to the actual answers as you study the unit. Students may think of their own questions as well. Keep a list of all the questions the class cannot answer to focus the lessons you teach during the unit.

After you record their responses on the cards, have students chant the words with you. Talk about the words: Which word is the most interesting? the least interesting? the most puzzling? What other word can you think of that means almost the same thing? What comes to your mind when I say _____? What do you think this word means? Etc.

2. Categorizing:

Distribute the word cards from the brainstorming session. Be sure to tell students the words you give them. Give younger students only one card at a time so they will not get confused. Have one student place his/her word card at the top of one of the masking tape strips and tell the word to the class. Ask if there is anyone else who has a word that belongs with the first word. Have another student place his/her word card under the first, read the word and explain why it belongs with the first word. Give a title to these two cards which now form a category. Ask if anyone can start a new category. When students have placed all of the brainstormed words in categories, discuss the titles and change them if necessary. Chant the words in each

category with students. Transfer the words to a flowchart to provide a permanent reference.



As you teach the unit you may wish to add new information to the chart. You may also identify new questions and, hopefully, the answers. At the end of the unit you can review the chart with students. Keep it as a reference for future use.

SAMPLE QUESTIONS

You can use these questions during the initial assessment activity to determine what experiences, language and knowledge students have about the topic. You can also use the questions for assessing thinking processes throughout the concept development and application phases of each lesson and during the culminating and evaluation activities.

QUESTIONS FOR ASSESSING EXPERIENCE:

1. Have you been in a situation where _____?
2. What do you know about _____?
3. Have you ever seen _____?
4. Have you ever experienced _____?
5. Have you ever been _____?
6. Have you ever done _____?
7. Has something like this ever happened to you?
8. When was the last time you _____?

QUESTIONS FOR ASSESSING LANGUAGE:

1. What do you think these words mean?
2. Can you give me another word that means _____?
3. What comes to your mind when I say _____?
4. Have you heard of the word(s) _____?
5. What words can you think of when I say the word _____?

QUESTIONS FOR ASSESSING THINKING PROCESSES:

Cognitive Memory (details, information)

1. Who.....?
2. What are the facts?

3. What are the most important details?
4. What is the.....?
5. What do you mean by.....?
6. What is your interpretation of what happened? (What do you think happened?)
7. When?
8. Where?

Convergent/Generalizing (getting the main idea)

1. What are the chief points?
2. Given that information, what is the main idea?
3. What is the single most important idea?
4. State the idea in one sentence.
5. Explain _____.

Structuring/Relating (arranging relationships)

1. Categories: Which group does that belong to?
   How would you classify.....?
   What type would you.....?
2. Comparisons: How are they alike? same? similar? identical?
3. Contrast: How is it different? in opposition to? unlike?
4. Cause and Effect: What will happen if? Why?
   What will happen as a result of?

Divergent/Using/Applying

1. What might happen if _____?
2. If you use that idea, what would it mean for _____?
3. Apply that idea to our (this) situation.
4. What would result if _____?
5. If you were given these facts, what would you do to _____?
6. How would it be different if we used this idea?
7. What could the advantages/benefits be if we applied this idea/process?
8. What do you think the (story/paragraph) will be about?

Evaluation/Judging/Valuing

1. How do you feel about this idea?
2. What is your opinion?
3. What is the best _____?
4. Are you satisfied with that answer/plan?
5. Can this statement be made? Why?
6. Out of all the information, what can be used to prove your point?
7. How would you judge?
8. What is your opinion or conclusion about the product/plan/idea?
9. Why did you think it worked/didn't work?
10. What is fact? What is opinion?

Science/Social Studies

1. Put objects into sets using various criteria: colour, living/non-living, shape, size, weight, etc.
2. Put objects into sets according to one property, e.g., round and yellow.
3. Order items from: soft to hard (marshmallow, feather, rock, pen, cotton, etc.)
   smooth to rough (sandpaper, velvet, burlap, sponge, etc.)
   light to heavy
   small to big
4. Examine various powders with a magnifying glass (sugar, starch, baking soda, baking powder, salt, etc.). Are they solids? How do you know? (NOTE: Do not allow students to taste powders.)

Teacher's Notes

These are possible activity ideas for this topic. They can be used in lessons, as warm-up, as confirmation activities, or as learning centre activities. Most can be done in any language. Activities with an * are actually used in the sample lessons which follow. Spaces have been left for you to record your own activity ideas.

ACTIVITY IDEAS

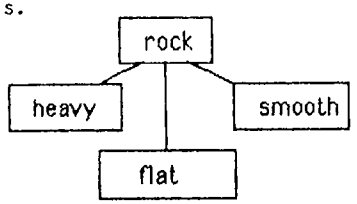
TOPIC A: PROPERTIES OF A SOLID

Math

1. Press a variety of solids into soft plasticene. Have students predict which will make the greatest indentation; the least.

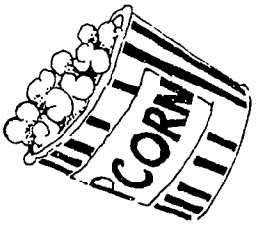
Language Arts

1. Make up lists of opposites in shape, size, texture, hardness, weight vocabulary. Find examples of each type of item. Make the words with items that illustrate the word: use rocks to write heavy; use cotton to write light; use ▲ shapes for triangle, etc.
2. Make a book About Solids. Each student can contribute one page that describes a solid.
3. Make mobiles describing various solids.



Music, Poems, Stories	Art

Physical Education/Movement	Special Activities
	1. Play "What's it?" One student describes the properties of an object; the others must guess what object is being described.



LESSON: PROPERTIES OF OBJECTS

As this lesson emphasizes language related to science concepts, you may wish to teach it during your Science period.

Science Concepts

1. Objects (solids) can be distinguished by physical properties such as colour, size, mass and shape.

2. Objects (solids) differ in their texture, hardness and relative weight.

English Vocabulary (*actually developed in this lesson)

* colour	* colour names
* texture	* rough/smooth
* size	* big/small
* weight	* heavy/light
* shape	* square/round/flat/oval/etc.
* hardness	* hard/soft

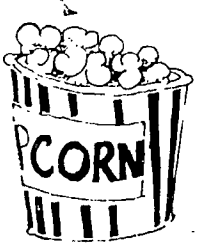
English Sentence Patterns (*actually developed in this lesson)

What words do we use to describe _____?
We use the words _____ and _____ to describe _____.

What words describe _____?
* _____ and _____ are words that describe _____.

How can _____ differ?
_____ can differ in _____.

Special Materials Required

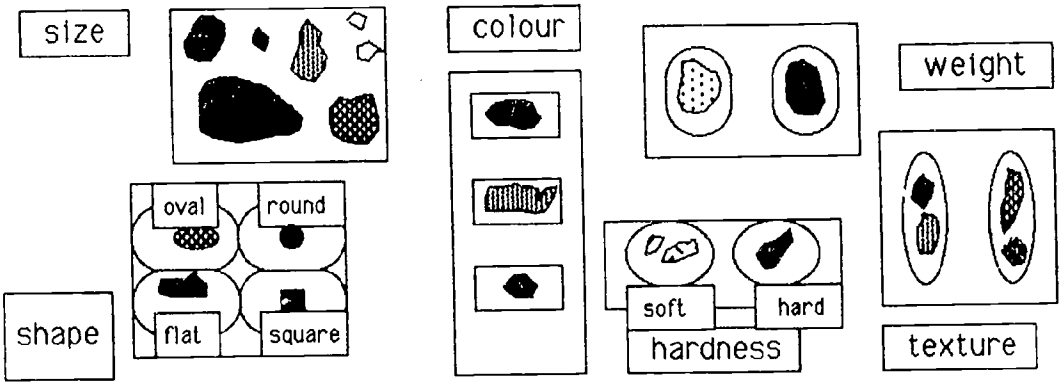


Collection of stones

Concept Development/Language Exposure

1. a) Go for a walk to collect stones. When you return to the classroom display the stones on a tabletop. After students have observed the stones for a few minutes, ask them to tell you ways in which the stones differ from each other. You may get responses such as "Some are big and some are small," or "Some are flat and some are round." Attempt to elicit categories of properties by discussing these responses, for example, "When you say that some stones are big and some are small what are you describing about the stones?" This discussion will provide opportunities to model the sentence pattern, for example, "Big and small are words that describe size." List the categories that students describe. If they do not think of them all, provide experiences that may lead them to discover these categories. For example, if they do not list the category 'hardness' have them try to break some of the rocks. They will discover that some break more easily than others. This can lead to a discussion of 'hard' and 'soft' and eventually to defining a category, i.e. 'hardness'.

   b) Have students make a display showing the ways that stones are different. You may wish to divide the class into six groups and have each group responsible for one category. Your display may look something like this:

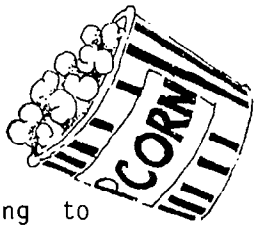


Discuss the various categories with the students using the sentence patterns as often as possible.

Language Practice

1. Elimination: Ask students to raise their hands when they hear a word that doesn't belong in the category named, for example:

Texture: hard, rough, red, heavy, smooth, round
(Students raise hands on hard, red, heavy and round.)



L/S 2. Categories: Assign each student a word belonging to categories studied in CD. Call out a category. Students belonging to that category must stand and say their words.

S 3. Categories: Students form a circle. One student, IT, stands in the centre. IT tosses a ball to a player in the circle and names a category (i.e., texture, hardness, colour, size, shape, weight). The player who catches the ball must name an example before IT counts to 10. If s/he is successful, s/he takes the thrower's place.

L 4. True/False: Teacher makes statements. Students indicate if they are true or false. For example:

Teacher: "Light and heavy are words that describe weight."
Students: "True."

Teacher: "Light and heavy are words that describe texture."
Students: "False."

L/S 5. Oral Cloze: Teacher provides part of sentence, students provide the rest. For example:

Teacher: "Red and blue are words that describe _____."
Students: "Colour."
OR
Teacher: "Red and _____ are words that describe colour."
Students: "Blue."

S/R 6. a) Sentence Strips: Have students name the six categories that were studied in CD. Write these words across the top of a chart. Read them with students. Have students give you words that fit in each category. Write these in the appropriate columns. Chant the words with students.

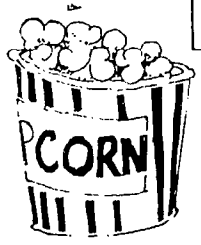
size	shape	weight	texture	hardness	colour
huge	oval	heavy	smooth	hard	gray
tiny	jagged	light	rough	soft	pink

b) Make up sentence strips as shown:

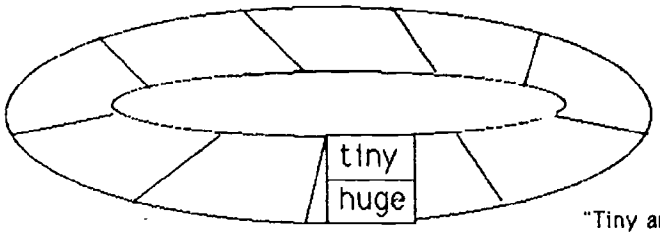
_____ and _____ are words that describe _____.

Demonstrate to students how words from the chart can be used to complete the sentences.

huge and tiny are words that describe size.



S/R 7. Cake Walk: Form a cake walk circle on the floor with masking tape. Tape two associated words in each section of the circle. Play music as students walk around the circle. Stop the music and have students say the sentence pattern related to the words on which they are standing.



"Tiny and huge are words that describe size."

R 8. Popsicle Stick Sentences: Write the beginning of a sentence on one stick in blue marker, the remainder on another stick in red marker. Students match the popsicle sticks to make correct sentences. For example:

Rough and smooth are words that describe | texture

L/W 9. Think quickly: Divide class into two or more teams. Have the teams stand in lines facing the chalkboard. Teacher calls out one of the categories. The first member of each team runs to the board, writes a word that belongs in that category, then runs to the end of his/her team and sits down.

W 10. Worksheet: Provide each student with a worksheet with examples as shown below:

_____ and _____ are words that describe texture.
_____ and _____ are words that describe hardness.
Etc.

Red and blue are words that describe _____.
Heavy and light are words that describe _____.
Etc.

Application

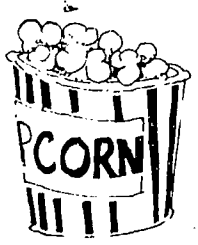
1. Have each student trace around his/her hand on a blank sheet of paper. They should choose one of the categories of properties discussed in CD activities and write five words that belong in that category, one on each of the fingers, for example:

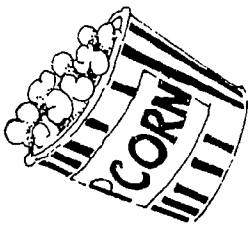
2. Mystery Bag: Place a variety of items in a bag. One by one, each student puts a hand into the bag and picks an item without looking at it. S/He must identify the mystery item. Discuss the properties of the item that helped the student decide what the item was.

3. Make up sentences based on the following pattern for each of the categories studied:

"I am heavy," said the big truck.
"Me too!" said the _____.

Have students illustrate the sentences.





LESSON: WHAT IS A SOLID?

As this lesson emphasizes language related to science concepts, you may wish to teach it during your Science period.

Science Concepts

1. Objects (solids) can be distinguished by physical properties such as colour, size, mass and shape.

2. Objects (solids) differ in their texture, hardness and relative weight.

3. Solids have distinct properties:

   a) ability to retain their shape, can be stacked.
   b) can be poured only if in small pieces.

English Vocabulary (*actually developed in this lesson)

* colour	* colour names	* solid
* size	* large/small	* liquid
* shape	* square/round	
* texture	* rough/smooth	
* weight	* heavy/light	
* hardness	* hard/soft	

(Note: Your students should know the vocabulary items listed in the middle column before you teach this lesson.)

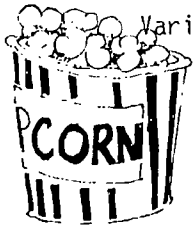
English Sentence Patterns (* actually developed in this lesson)

* What is a solid?
* A solid is something that has _____.

* This/That solid is _____.
* These/Those solids are _____.

Special Materials Required

Variety of familiar solids and liquids
Variety of containers



Concept Development/Language Exposure

1. a) Seat students in a large circle. Ask each student to empty his/her pockets. Talk about and compare objects using descriptive vocabulary. Ask students if they can think of any ways in which all of the objects are similar. Discuss their ideas. Direct the discussion to the idea that although the objects may be different colours, sizes, etc., they all have a colour, a size, a weight, etc. Introduce the term "solid/s" and explain that all of the objects you have examined are solids.

   b) Have students examine the objects and discuss their properties (colour, size, weight, etc.). For example:

   "This solid is red.
   It is smooth.
   It is heavy.
   It is small.
   It is round."

   Ask students questions about the statements they make. For example: "When you said this solid was red, what were you telling us about it."

   c) Model the sentence pattern, for example:

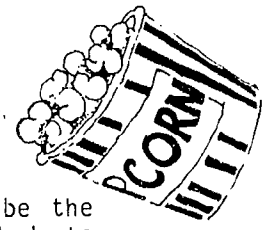
   "A solid is something that has colour."

   Repeat this process until you have stated all the properties of a solid.

   d) Prepare a chart as shown below. Have students describe objects in each of the categories noted on the chart. Record information on the chart.

object	colour	size	shape	weight	texture
	red and white	big	round	light	smooth

Model the sentence pattern, "This/That solid is _____" as you refer to the chart.



2. Examine several solids with students and have them describe the properties of each. Now, examine a glass of water. Can students describe the same properties? Pour the water into containers of various sizes and shapes. What happens to the water? Try pouring some solids (pencils, plasticene, blocks) into different containers. Do they change their shapes? Pour some water into students' hands. Can they hold on to it? Pour some blocks into their hands. Did they pour like the water did? Can students hold onto them? Why could they hold the blocks but not the water? Discuss the fact that a solid has a shape of its own; the shape of a solid does not change by itself.

3. Label two large trays: SOLID and NOT A SOLID.

   Sort a collection of items and place them on the appropriate tray. Model the sentence patterns as you sort. Include items such as salt, sugar, sand, etc. which will lead to more discussion about the properties of solids.

Language Practice

L 1. Discrimination: Have students clap their hands each time they hear a specified word in a list of other words. For example:

   "Listen for the word texture: Texas, texture, text, textile, texture, etc."

L 2. Hop the Line: Make a line on the floor with masking tape. Have students stand along the line with their toes touching it. Ask questions of a puppet. If student thinks the puppet's answer is true, they hop over the line; if they think it is false, they stand still. For example:

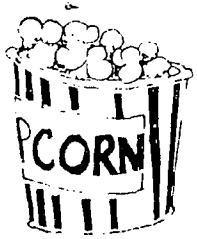
   Teacher: "What is a solid?"
   Puppet: "A solid is something that has a shape."
   (Students hop over the line.)

   Teacher: "What is a solid?"
   Puppet: "A solid is something that bounces."
   (Students stand still.)

L 3. Riddles: Place objects on a table. Make up a riddle about one of the objects. For example:

   "This solid is white. It is small. It is bumpy.
   It is heavy. It is round. What is it?"

   Students examine the objects and try to guess which one you have described. After doing several examples, let students take turns making up their own riddles.



L/S 4. Hot Potato: Seat students in a circle on the floor. Pass one of the objects observed during Concept Development activities around the circle as music plays. When the music stops the teacher calls out a statement such as, "A solid is something that has a size." The student holding the object must describe that property of the object, for example: "This solid is tiny."

L/S 5. Chain Drill: Seat students in a circle on the floor. Give an object to one student who must describe one of its properties, for example: "This solid is large." The next student must repeat the first statement, then describe another property of the object, for example: "This solid is large. This solid is smooth." Continue in this way until all properties have been described.

L/R 6 a) Write the categories on word cards. Make one set for each student. Call out a statement such as, "A solid is something that has a shape." Teacher holds up the appropriate word card. Students hold up the same word card.

E.g.

b) Place word cards in the following sentence strip:

A solid is something that has	

Read completed statements with students.

R 7. Surprise Packet: Wrap an object in pieces of newspaper. Between each layer of newspaper and the next tape a small piece of paper with a message describing the object. Tape one on the outside of the packet as well. Pass the packet around as music plays. When the music stops, the student holding the packet attempts to read the exposed message. If successful, s/he may remove the next layer of newspaper, then pass the packet to the next player. To add suspense, have students attempt to guess what is in the packet after each clue has been read.

R/W 8. Matching: Have each student select one object and describe its five properties. For example:

This object is round.
This object is red and white.
This object is big.
This object is light.
This object is smooth.

Place the descriptions in a pile next to the objects. Have students attempt to match the descriptions to the objects.

Application

1. Blindfold a student and have him/her withdraw an object from a bag of objects. Student must describe the shape, texture, weight, hardness and size of the object, then try to guess what it is.

2. Have each student select an object. Have them draw a picture of it and describe it using similes, for example:

   This is a volleyball.
   It is as round as the moon.
   It is as smooth as glass.
   It is as big as my head.
   Etc.

   Do several examples with the class before having students do this activity individually. Provide models which students may refer to. You may also wish to present this activity as a worksheet (frame sentences provided.)

   This is a _____.
   It is as _____ as _____.
   It is as _____ as _____.
   Etc.

3. Have students browse through magazines to find pictures of interesting solids. Have them cut the pictures out and paste them on sheets of coloured paper (one picture per sheet). Have each students or pair of students choose one of the pictures. Have them cut out words from the magazines that describe the shape, size, texture, weight and colour of the picture. Have them arrange the words on the sheet with the picture.

Science/Social Studies	Teacher's Notes
1. Observe changes in solids over a period of time. E.g., Leave a slice of bread on a table overnight. Put hard sugar in a jar with a slice of apple. Leave an ice cube on the table. Etc. 2. Match crushed or broken solids with whole solids. E.g., sugar granules --> sugar cube broken chalk --> new chalk stick Describe what property/properties changed. 3. Add water to various solids. Have students predict what changes will occur.	These are possible activity ideas for this topic. They can be used in lessons you make up, as enrichment activities, or as learning centre activities. Most can be done in any language. Activities with an * are actually used in the sample lessons which follow. Spaces have been left for you to record your own activity ideas.

ACTIVITY IDEAS

TOPIC B: CHANGES IN PROPERTIES OF SOLIDS

Math	Language Arts
	1. Discuss ways in which students have changed: physical changes; mental changes; emotional changes. Have them make books describing these changes using the frame sentence, "I used to _____, but now _____."

Music, Poems, Stories

Art

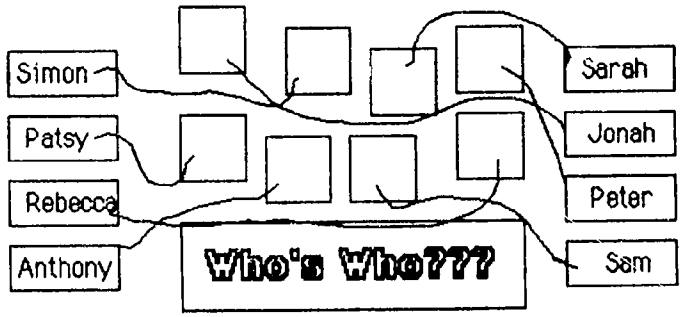
Physical Education/Movement

1. Have pairs of students act out before/after states of specific objects. The rest of the class must guess what the object is.

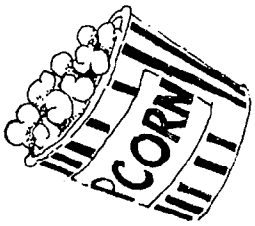
   E.g., Ice cube/puddle of water
   Caterpillar/butterfly
   Baby/person

Special Activities

1. Have students bring their baby pictures to school. Use them to make a bulletin board.



Discuss ways in which students have changed.



LESSON: SOLIDS CAN CHANGE

As this lesson emphasizes language related to science concepts, you may wish to teach it during your Science period.

Science Concepts

1. Change occurs where the properties of objects are modified.
2. Changes in properties of objects (solids) can occur when water is added to some objects.
3. Changes in properties of objects (solids) can occur when the objects are heated or cooled.
4. Some changes occur slowly and others rapidly.
5. Some changes are more easily reversed than others.

English Vocabulary

* names of familiar solids
* change
* verbs - heating
  cooling
  adding water
  crushing
  stretching
  squishing
  etc.

English Sentence Patterns

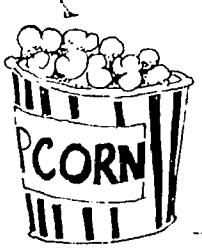
* How can you change solids?
* You can change some solids by _____ them.

How did the _____ change when _____?
When _____ the _____ _____.

Special Materials Required

Variety of familiar solids (Candle, sponge, buttons, paper, feather, stone, coins, plasticene, balloons, sugar, salt, chalk, ice cubes, etc.)

Before/After pictures (photos or illustrations)



Concept Development/Language Exposure

1. Introduce the concept of "change" by looking at before and after pictures. Some examples: puppy/adult dog, baby/boy, building under construction/completed building, autumn scene/winter scene, bread/toast, etc. Discuss the ways in which the objects in the pictures have changed. Have students speculate as to the reasons for the changes. Discuss the lengths of time involved in the changes: Do some changes take longer to occur than others? Ask students to think of a change that happens over a long period of time and a change that happens very quickly. Record and discuss their ideas.

2 a) Display a variety of solids on a tabletop. Select one of the solids (a piece of white paper would be a good choice to begin with). Review the properties of the paper - size, shape, colour, weight, texture. Ask students to think of ways in which the size of the paper could be changed. Record their ideas. Try some of them (e,g,. cut with scissors, tear, crumple). Discuss the results. Record the ideas that worked to change at least one property of the paper on a chart. Go through this procedure with the other properties. When you have finished the activity you should have a chart that looks somewhat like this:

object	size	shape	colour	texture	weight
white paper	cut it tear it crumple it	tear it fold it burn it	colour it paint it	put in water crumple it	put in water

b) Divide class into groups. Each group selects a solid from the table and attempts to change it using a variety of methods. (NOTE: Any experiments that involve heating must be closely supervised or carried out by the teacher.) Have groups present the results of their experiments to the rest of the class. Add their ideas to the chart.

c) Discuss the rates of change that were observed in the various experiments. Which changes occurred over a long time? Which changes occurred very quickly?

d) Demonstrate a change that can be easily reversed (inflating and deflating a balloon) and ask students to think of others. Review the chart, discussing whether the changes that occurred could be easily reversed.

e) Review the actions that can be used to change solids. (Refer to the chart.) Model the sentence patterns often as you discuss the changes.

3. Infer the reason(s) for change by comparing changed objects (solids) to their original state.

E.g., burned match/match
used crayon/new crayon
frozen peas/fresh peas
etc.

As students discuss the reasons for the changes, model the sentence pattern.

Language Practice

L 1. Run and Touch: Display the solids on a tabletop. Call out a statement and a student's name. The student must run to the table and touch one solid that can be changed in the way specified. For example:

Teacher: "You can change some solids by tearing them."
Student touches a piece of paper.

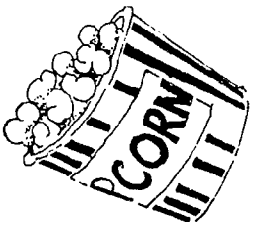
L/S 2. Substitution Drill: Teacher makes a statement, then provides a word or phrase for students to substitute. For example:

Teacher: "You can change some solids by heating them. Crushing."
Students: "You can change some solids by crushing them."

L/S 3. Hot Potato: Seat students in a circle on the floor. Pass one of the solids around the circle as music plays. When the music stops, the class asks a question of the student left holding the object. S/He must state one way in which the solid may be changed. For example:

Class: "How can you change solids?"
Student: "You can change some solids by heating them."

S/R 4. Experience Chart: Give each student one of the solids. Write the sentence, "How can you change solids?" at the top of a sheet of chart paper. Have each student, in turn, demonstrate one way in which s/he can change the solid s/he is holding and describe that action. Record students' statements on the chart. (If student does not use the sentence pattern, model it for the class and record it on the chart.) Your chart may look like this:



Mary: "You can change some solids by adding water to them."

John: "You can change some solids by squishing them."

etc.

Review the chart with students: Have each student read his/her statement to the class; have class read all statements together; read one of the statements and have students point to it on the chart; point to one of the statements and have students read it; etc.

R/W 5. Overhead Vanishing Drill: Write the statements on an overhead leaving out words or phrases as shown below. Have individual students (volunteers) come up to fill in the blanks. Allow them to refer to the experience chart.

You can change some solids by crushing them.
You can change some solids by _____ them.
You can _____ some solids by _____.
You can _____ by _____.
You _____ by _____.

_____.

Give the whole class a similar activity as a worksheet that can be done individually or in pairs.

Application

1. Give each student two balls of different coloured plasticene. Ask them to change: the shape of the plasticene.
the size of the plasticene.
the texture of the plasticene.
the weight of the plasticene.
the colour of the plasticene.

Discuss the actions which the students used to change each property of the plasticene.

Science/Social Studies	Teacher's Notes
1. Research the history of popcorn. 2. Visit the store to find various forms of corn: frozen; canned, kernel and creamed; popcorn; fresh corn on the cob, etc. Have a tasting party to sample to different kinds of corn. 3. Discuss the reason that corn pops. (Inside each popcorn kernel is a tiny bit of water. When the kernel gets hot, the bit of water turns to steam. The steam pushes against the shell of the kernel until it finally bursts.) Try pricking the shells of some kernels, then try to pop them. What happens? Why? 4. Talk about how each sense is affected when popcorn is popped: sight, smell, taste, hearing, feeling.	These are possible activity ideas for this topic. They can be used in lessons you make up, as enrichment activities, or as learning centre activities. Most can be done in any language. Activities with an * are actually used in the sample lessons which follow. Spaces have been left for you to record your own activity ideas.

ACTIVITY IDEAS

TOPIC C: POPCORN IS A SOLID

Math	Language Arts
1. Estimate the number of kernels in a jar or popped popcorn in a bowl. 2. Use popcorn to practice counting by 2's, 5's or 10's. 3. Measure length of your hand or foot using popcorn kernels. 4. Measure length of time it takes for first kernel to pop; last kernel. 5. Write addition/subtraction facts on popcorn shaped cards. (Or make felt popcorn to use on the flannelboard.) 6. Make worksheets with number facts written on popcorn shapes. (See sample included.)	1. Tape record the sounds that popping corn makes. Try to write these sounds as words. 2. Discuss the word "popcorn": i.e., corn that pops --> pop-corn. List other compound words and discuss their meanings and origins. (Why are "butterflies" called that?) 3. Point out that "pop" is a word that can be spelled backwards or forward. Make a list of others (mom, dad, etc.). 4. List words that we could use to describe popcorn popping (e.g., explode, burst, etc.). 5. List words that rhyme with "pop." 6. Word hunt using words that describe popcorn. 7. Introduce "heavier than/lighter than." Compare popcorn to other solids. Make lists: Popcorn is heavier than _____, _____, _____. Popcorn is lighter than _____, _____, _____. 8. Write words that rhyme with "pop" and "corn" on popcorn shapes.

Music, Poems, Stories

See poems and songs at the end of this unit.

Art

1. Make a seed mosaic using popcorn kernels and other kinds of seeds. (Kidney beans, dried peas, etc.).
2. Use popcorn to make "snowy day" pictures.
3. Make popcorn chains/necklaces/bracelets.
4. Make coloured popcorn by dipping popped corn in water coloured with food colouring. Place dyed popcorn on paper towels to dry. Use it to:
   - make your name
   - make a collage
   - make numerals or letters
   - do various colour and classification activities.
5. Make popcorn ball snowmen.
6. Design a label for a jar of popcorn.

Physical Education/Movement

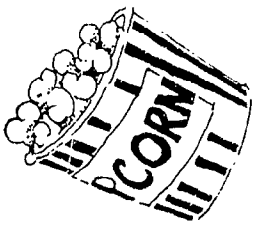
1. Have students pretend to be:

   - kernels of popcorn in a jar
   - kernels of popcorn being popped
   - popcorn being eaten.

Special Activities

1. Make a Popcorn Cookbook. Provide each student with a copy to take home. Try some of the recipes -- good fund-raising items!
2. Write books using frame sentences. For example:
   a) There are many ways to eat popcorn. You can eat it with salt.
   eat it with butter.
   eat it from a bag.

   b) I like to eat popcorn at the show.
   in the winter.
   while I watch T.V.
3. Collect popcorn containers (like those sold in at the movies). Cut popcorn shapes from white construction paper. Label these with words to alphabetize, days of the week to be sequenced, etc. Colour code each set of cards to a container. Students select a container and complete the activity.



LESSON: MAKING POPCORN

As this lesson emphasizes language related to a song, you may wish to teach it during your Music or Language Arts period.

Science Concepts

1. Changes in properties of objects (solids) can occur when the objects are heated or cooled.
2. Some changes occur in a regular pattern and can be ordered.
3. Some changes occur slowly and others rapidly.

English Vocabulary (*actually developed in this lesson)

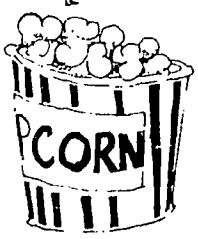
* oil	* heat	first
* kernels	* pop	then
* salt	* pot	after that
* popcorn		finally

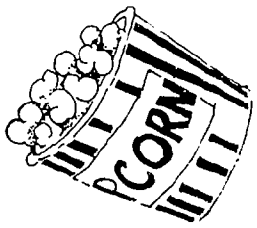
English Sentence Patterns (*actually developed in this lesson)

* Put the _____ in/on _____.
* How do you make _____?
* First/Then/Next/After that/Finally you _____. (Exposure Only)

Special Materials Required

Popcorn
Pot, oil, butter, salt, stove or hot plate
Illustrations of ingredients - oil, butter, salt, pot, kernels
Cardboard tubes
Individual booklets





MAKING POPCORN

(To the tune of "Put Your Finger in the Air")
By M. Gilmour and C. McGregor

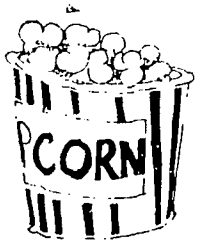
Put the oil on to heat, on to heat.
Put the oil on to heat, on to heat.
Put the oil on to heat,
Get ready for a treat,
Put the oil on to heat, on to heat.

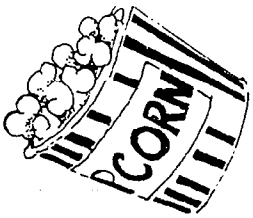
Put the kernels in to pop, in to pop.
Put the kernels in to pop, in to pop.
Put the kernels in to pop,
Don't forget the top,
Put the kernels in to pop, in to pop.

Put the butter in the pot, in the pot.
Put the butter in the pot, in the pot.
Put the butter in the pot,
Let it get really hot,
Put the butter in the pot, in the pot.

Put the salt on the corn, on the corn.
Put the salt on the corn, on the corn.
Put the salt on the corn,
It's so good when it is warm,
Put the salt on the corn, on the corn.

Put the popcorn in your tummy, in your tummy.
Put the popcorn in your tummy, in your tummy.
Put the popcorn in your tummy,
Doesn't it taste yummy,
Put the popcorn in your tummy, in your tummy.





Concept Development/Language Exposure

1. Ask students if any of them have made popcorn before. What things are necessary to make it? Have students attempt to explain the steps involved in making popcorn.

2. a) Write a recipe for making popcorn on chart paper. Use illustrations wherever possible (a rebus recipe). Review the recipe with students. Tell them that you know a song that will help them remember the steps involved in making popcorn. Sing the song "Making Popcorn" and use appropriate actions.

   b) Make a batch of popcorn with students. Sing the appropriate verses as you proceed. Take pictures of the activity. Use these in a language experience chart describing the popcorn making.

   c) When you have eaten all the popcorn, review the procedure. You may wish to introduce sentence patterns, "First/Then/ Next/Finally you _____," at this point.

   d) Sing the song again with students.

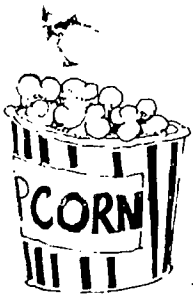
Language Practice

L 1. Upset the Popcorn Bowl: Make enough copies of the illustrations (at least two of each) so that each student can hold one. Have students hold their illustrations and sit in chairs arranged in a circle. Teachers calls out a word; students holding that illustration trade places occasionally; teacher calls out "popcorn"; everyone must then trade places.

L/S 2. Oral Cloze: Sing the song using the illustrations as visual cues. Omit key words; have students provide these.

E.g., Teacher: Put the oil on to heat, on to _____.
Put the _____ on to heat, on to _____.
Etc.

S 3. Logical Continuation: Try this activity when students know the song well. Have students form a circle. One student starts the song, then stops suddenly. The student to his/her right tries to carry on. If s/he can't, the next student tries.



S 4. Charades: Have a small group decide which verse they would like to act out. Allow them a few minutes to practice the actions. The rest of the students attempt to guess the verse that is being dramatized.

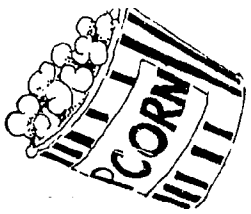
S/R 5. a) Sentence Strips: Prepare sentence strips of the song ahead of time. As you sing the song with students, place the sentence strips in the pocket chart.

E.g.,

Put the oil	on to heat	on to heat
Put the oil	on to heat	on to heat
Put the oil	on to heat	
Get ready for a treat!		
Put the oil	on to heat	on to heat

Sing the song several times as you point to the words. Have students match illustrations to the appropriate verses.

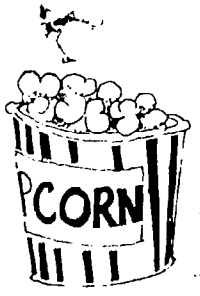
R b) Distribute sentence strips to students. They must first find the other students holding strips that belong with their own, then work as a group to reconstruct their verses.

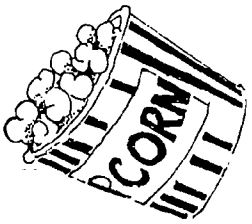


R 6. Odd One Out: Write statements from the song on sentence strips. Add one statement that doesn't belong. Have students put the strips into the correct sequence and eliminate the one that doesn't belong. For example:

BEFORE	AFTER
Put the oil on to heat.	Put the oil on to heat.
Put the salt on the corn.	Put the kernels into pop.
Put the popcorn in your tummy.	Put the butter in the pot.
Put the butter in the pot.	Put the salt on the corn.
Put the sugar in the pan.	Put the popcorn in your tummy.
Put the kernels in to pop.	

This activity works best with a small group. (Provide several sets of sentence strips.)

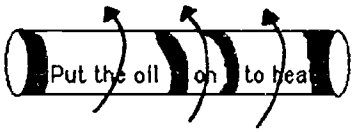




R/W 7. Sentence Maker: Make a rotating sentence maker as shown below. Have students make the sentences from the song. Then have them make the silliest sentence they can. Have them copy the sentences they make.

tube

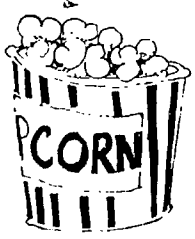
Put the oil	In	to heat
Put the kernels		to pop.
Put the butter		the pot.
Put the salt	on	the corn
Put the popcorn		in your tummy.

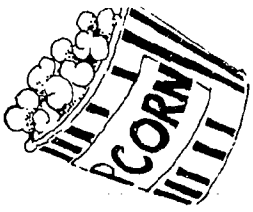


Wrap a sheet of paper around a cardboard roll and mark the circumference. Write the words in columns that will make up the sentences. Cut into strips; wrap these around the roll and join ends with tape. They should revolve easily.

W 8. Vanishing Drill Booklets: Write each verse on a stencil using the vanishing technique. Have students complete the sentences and illustrate their booklets.

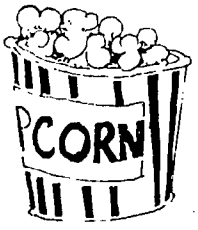
Put the oil on to heat, on to heat
Put the ___ on to heat, on to _____
Put the _____
Get ready for a treat!
Put _____, _____.

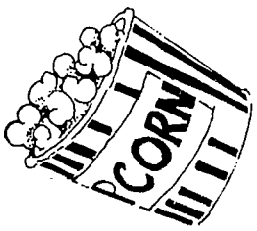




Application

1. Make a rebus chart of the song.
2. Adapt the song for another simple recipe.
3. Write and illustrate advertisements to sell the popcorn you make.





LESSON: POPCORN IS _____

As this lesson emphasizes language related to a poem, you may wish to teach it during your Language Arts period.

Science Concepts

1. Objects can be distinguished by physical properties.

English Vocabulary (*actually developed in this lesson)

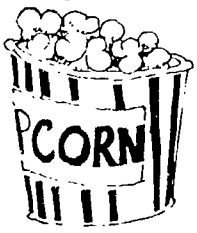
* descriptive words (Brainstorm with students.)

English Sentence Patterns (*actually developed in this lesson)

* Popcorn is _____.

Special Materials Required

Popcorn
Popcorn shaped word cards
Popcorn shaped pages
Wax



Concept Development/Language Exposure

1. a) Prepare a batch of popcorn with students. Let each student have a portion of the popcorn to smell, look at, feel, and taste. Brainstorm words that describe popcorn. Record them on a chart:

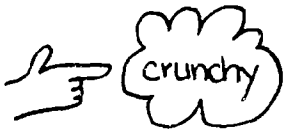
smells	tastes	looks	feels	sounds
yummy	delicious	like snow	light	crackly
buttery		white	soft	sizzly

Chant the words as you point to them.

b) Place this sentence strip next to the chart:

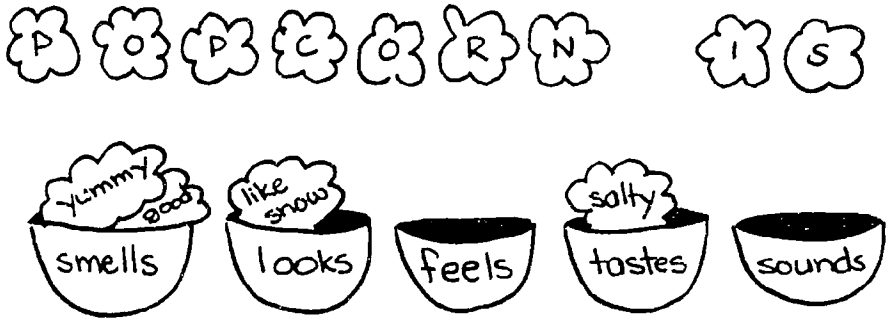
Popcorn is _____.

Point to each word on the chart and model the sentence pattern, for example:



"Popcorn is crunchy."

2. Copy the words from the chart made in #1a) onto popcorn shaped cards. Prepare a bulletin board as shown below. (Thanks to Irene [Wojtecka] Williams for this idea.)



Hold up one of the word cards. Model the pattern:

Have students decide which bowl the word belongs in. Have one student place it in the appropriate bowl.

Language Practice

L 1. Discrimination: Tell students to listen for words that sound the same. If they hear two words that don't sound the same, they clap their hands. For example:

Teacher: "fluffy/fluffy, salty/salty, light/white, etc."
Students clap when they hear "light/white."

L 2. Elimination: Teacher says a list of words that describe popcorn. Students wave their arms when they hear a word in the list that does not belong, for example:

Teacher: "Popcorn is fluffy crispy, black, and yummy."
Students wave their arms when they hear "black."

L/S 3. Relay Race: Divide the class into two teams. Have a "spoon and popcorn" race. The runners on each team must repeat a statement made by the teacher, then run to the finish line balancing a piece of popcorn on the spoon. Repeat until all players have had a turn.

L/S 4. Expansion Drill: Teacher begins with a statement, for example, "Popcorn is white." First student repeats the statement and adds another word to describe popcorn, for example, "Popcorn is white and fluffy." Continue until someone cannot remember the sequence of descriptive words or cannot add a new word.

L/S 5. Beanbag Toss: Teacher calls out a word and tosses a beanbag to one student. That student must make a statement using the word, then throw the beanbag back to the teacher. (After a few rounds, the student could call a word and throw the beanbag to another student.) For example:

Teacher calls out "crunchy" and tosses beanbag. Student says, "Popcorn is crunchy," and throws beanbag back.

L/S/R 6. Wax Resist: Paint the descriptive words on a large popcorn-shaped piece of paper with wax. (Do this ahead of time.) Make a statement such as, "Popcorn is salty." As you do, paint over the word "salty" with dark coloured paint and it will magically appear. Read the words with students. Point to a word and have students read it. Point to a word and have students use it in a sentence. Call out a word and have students point to it.

L/S/R 7. Find the Word: Write descriptive words on popcorn shaped cards. Have students stand in a circle holding hands. One student stands outside the circle. Place word cards in the centre of the circle. Teacher makes a statement, e.g., "Popcorn is fluffy." The student must try to enter the circle to get the word card, while the other students try to prevent him/her from doing so by raising and lowering their arms. When the student does reach the centre of the circle, s/he must find the correct card and repeat the statement. Repeat until all students have had a turn.

R 8. Eat the Popcorn: Write descriptive words on popcorn shaped cards. Place cards in a large bowl. Students, in turn, reach into the bowl and grab a handful of "popcorn." They may "eat" (keep) any of the pieces they can read.

R 9. Balloon Words: Write descriptive words on white balloons (popcorn). Throw them up into the air and have students attempt to catch them. Students read the words on the balloons they catch.

S/R 10. a) Poem Building: Review the concept of rhyming words with students. Brainstorm words that rhyme with the words listed on your chart in CD#1a). Demonstrate to students how a simple poem can be put together using these words. Write the statements on sentence strips and place them in the pocket chart. For example:

Popcorn is fluffy,
Popcorn is white,
Popcorn is crispy,
And very light.

Popcorn is yummy,
Popcorn is neat,
Popcorn is scrumptious,
And such a treat!

Chant the poem with students several times. Remove sentence strips from the chart and distribute to students. Have them replace the strips in the appropriate places as you chant the poem together.

R/W b) Have students make up sentence strips using other descriptive words from the chart. Have them attempt to put them together to make their own verses for the poem. (Have them work in small groups to do this.) Have them place their sentence strips in the pocket chart in the appropriate order and chant their new verse for the rest of the class.

W c) Have students copy the poem (including new verses) onto popcorn shaped pages. Staple pages together to make a book.

W 11. Have students make tachistoscopes in the shape of popcorn.

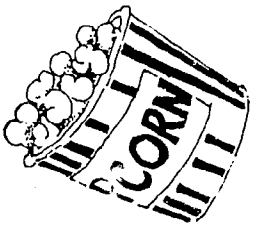
Application

1. a) Have students write poems about the words they used to describe popcorn:

What is _____?

For example: What is fluffy?
Fluffy is my favourite dog.
Fluffy is the fur on my hood.
Fluffy is a cloud in the sky.

b) Make collages using real materials and pictures. For example, a "fluffy collage" could have bits of popcorn, fur, cotton batting, etc. and pictures of clouds, kittens, etc.



2. Write cinquain poems about popcorn following this formula:

one word
two words
three words
four words
one word

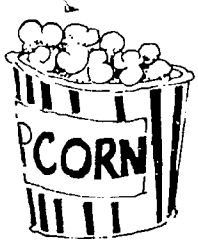
Popcorn
Fluffy, white
Buttery and salty
Waiting in the bowl
YUM!

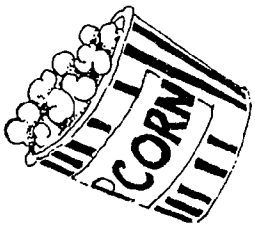
3. Have students discuss questions such as these:

What if popcorn grew on trees?
What if it snowed popcorn?
What if popcorn was bubblegum?
Etc.

Record students' ideas. Use them to write class stories.

4. Have students practice writing vocabulary items from the lesson by gluing unpopped kernels onto cardboard.





LESSON: HOW POPCORN CHANGES

As this lesson emphasizes language related to science concepts, you may wish to teach it during your Science period.

Science Concepts

1. Change occurs where the properties of objects are modified.
2. Changes in properties of objects can occur when the objects are heated or cooled.
3. Some changes occur in a regular pattern and can be ordered.
4. Some changes are more easily reversed than others.
5. Some changes occur slowly and others rapidly.

English Vocabulary (*actually developed in this lesson)

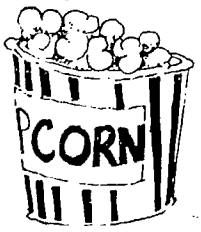
* size	* small	* big
* shape	* flat	* fluffy
* colour	* yellow	* white
* texture	* smooth	* bumpy
* hardness	* hard	* soft

English Sentence Patterns (*actually developed in this lesson)

How did the popcorn change?
The popcorn changed in shape, size, etc.

* How did the popcorn change in _____?
* Before, the popcorn was _____; now it is _____.

Special Materials Required



Popcorn kernels, popped popcorn
Kernel shapes, popcorn shapes

Concept Development/Language Exposure

1. Give each student a popcorn kernel and a piece of popped popcorn to examine. Discuss the properties of each. Have students brainstorm words to fill in a chart:

	BEFORE	AFTER
texture	smooth	bumpy
size	small	big
shape	flat	fluffy
colour	yellow	white
hardness	hard	soft

Review the chart; model the sentence patterns. Discuss what caused the changes in the popcorn. Did the changes occur slowly or quickly? Could any of the changes be reversed?

Language Practice

L 1. Thumbs Up/Thumbs Down: Have C.A. (or a puppet) ask questions of the teacher. If teacher's response is true, students give "thumbs up." If the response is false, students given "thumbs down." For example:

C.A.: "How did the popcorn change in texture?"
Teacher: "Before the popcorn was smooth; now it is lumpy."
(Students give "thumbs up.")

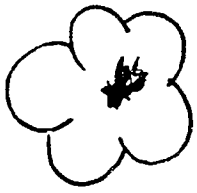
L/S 2. Hot Popcorn: Have students sit in a circle. Make a statement. Give students a bowl of popcorn to pass around as music plays. When the music stops, the student holding the bowl must repeat the statement. If s/he does so correctly, s/he may eat some popcorn.

L/S 3. Oral Cloze: Teacher makes a statement omitting a key word or phrase. Students provide the word/phrase.

E.g., Teacher: "Before the popcorn was tiny; now _____."
Students: "It is bigger."

S 4. Hungry Blindman's Bluff: Have students crouch down within a circle, pretending to be popcorn kernels. (Mark a circle on the floor with masking tape.) One student is blindfolded and stands in the centre of the circle. On a signal from the teacher (i.e., "The oil in the pan is nice and hot.") students begin to "pop." The hungry blindman tries to grab a "piece of popcorn." If s/he is successful s/he asks a question, "How did the popcorn change in _____ _____?" If the "popcorn" answers correctly, s/he becomes the new blindman.

S/R 5. a) Brainstorming: Cut a large kernel shape from bristol board. Have students call out descriptive words. Record on cards and place below kernel. Repeat this process with a popcorn shape. For example:

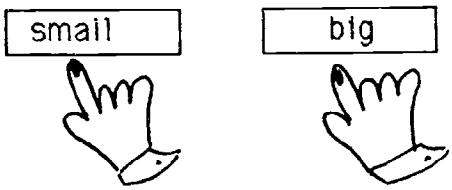


small	bumpy
flat	soft
yellow	fluffy
hard	big
smooth	white

b) Have students assist you in rearranging cards so that words describing the same property are side by side. For example:

small	big
flat	fluffy
yellow	white
hard	soft
smooth	bumpy

c) Ask students what property the first words in each column describe. Model the sentence pattern, "How did the popcorn change in colour?" Provide the answer as you point to the appropriate cards.



"Before, the popcorn was small; now it is big."

Repeat until all properties have been described (before and after).

R/W 6. Matching: Write "before" statements on kernel shapes; "after" statements on popcorn shapes. (Make several sets.) Students match the kernels to the correct pieces of popcorn. For example:

Before the popcorn was hard; now it is soft.

Have students copy complete and correct statements.

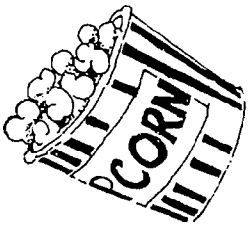
(Note: This activity could be done later as an individual worksheet.)

Application

1. Examine other foods in their original and prepared states. For example:

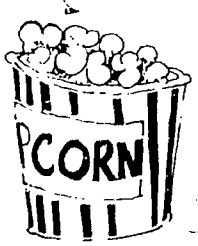
   dry spaghetti/cooked spaghetti
   bannock dough/cooked bannock
   juice crystals/juice
   fresh caribou/cooked caribou
   etc.

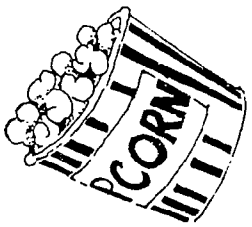
   Discuss how each food has changed (i.e., colour, size, shape, texture, hardness, weight). What caused each change?



2. Make lists of foods that are prepared by:

   a) heating;
   b) cooling; (freezing?)
   c) adding water;
   d) two of the above;
   e) all of the above.





LESSON: HOW DOES HEAT AFFECT POPCORN?

As this lesson emphasizes language related to a poem, you may wish to teach it during your Language Arts period.

Science Concepts

1. Changes in properties of objects (solids) can occur when the objects are heated or cooled.
2. Some changes occur slowly and others rapidly.

English Vocabulary (*actually developed in this lesson)

* popping
* sizzling
* exploding

* other verbs brainstormed by students.

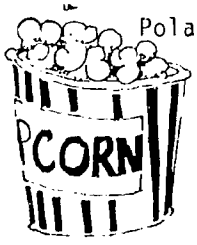
English Sentence Patterns (*actually developed in this lesson)

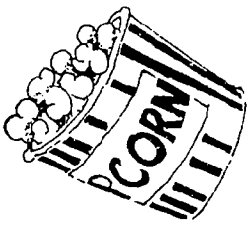
* What is the popcorn doing?
* The popcorn is _____.

* Popcorn _____.
  Popcorn _____.
  Popcorn _____.
  Pop! Pop! Pop!

Special Materials Required

Popcorn
Polaroid camera





Concept Development/Language Exposure

1. a) Pop only a few kernels of popcorn in a large lidless pot. Have students observe the popcorn closely. Attempt to take polaroid photos.

   b) Ask students to crouch on the ground and pretend they are kernels of popcorn. Tell them that you are going to slowly turn the heat up under them. Have them act out (with sounds, words, and motions) what happens to the kernels.

   c) Have students recall the sounds and sights of the popcorn as it got hotter and hotter. Try to elicit many descriptive verbs from them. Record these on the chart.

What is the popcorn doing?		
sizzling	popping	hopping
exploding	crackling	dancing
bursting	leaping	

Review the chart: Point to each word as you model the sentence pattern.

bursting

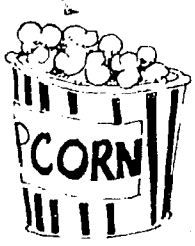
"The popcorn is bursting."

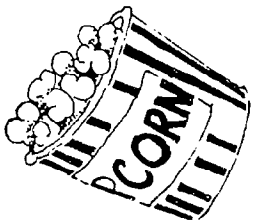
   d) Review the chant again. This time use the pattern, "Popcorn _____." Have students chant, "Pop! Pop! Pop!" after each example.

bursting

Teacher: "Popcorn bursting."

Students: "Pop! Pop! Pop!"





Language Practice

L 1. Pop Up: Have students crouch down and listen for words that describe popping kernels. When they hear one they should "pop up," then crouch down again. For example:

Teacher: "Running, bursting, swimming, laughing, leaping" and so on.

L/S 2. Popcorn Chains: Divide class into two teams. Teacher ask the first player on TEAM A, "What is the popcorn doing?" If s/he answers appropriately, s/he strings a piece of popcorn on a thread. Continue until none of the players can answer.

S 3. Chant: Sit in a circle with students. Start a rhythm (e.g., snapping fingers, clapping hands) and chant one of the brainstormed verbs. On the last syllable, point to a student - that student must pick up the rhythm and add a word. For example:

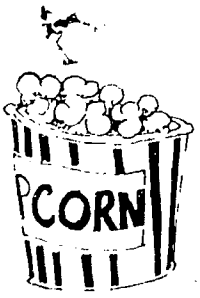
Teacher: "Snap, snap, sizzling, sizzling."
Student #1: "Clap, clap, bursting, bursting."

S 4. Choral Speaking: First student starts with "Popcorn _____." Other students chant, "Pop! Pop! Pop!" Continue until each student who wishes to has had a chance to say a line.

S/R 5. Pocket Chart: Review the chart made in CD#1c). Copy verbs onto cards. Place a verse such as the one below in the pocket chart. Chant it with students.

Popcorn	popping
Popcorn	sizzling
Popcorn	exploding
Pop!	Pop! Pop!

Work with students to create other verses - juggle the words until you arrive at a sequence that is pleasing. Chant in various ways - whole class, small groups, or individuals. Chant each line, etc.



R 6. Word Hunt: Make two sets of popcorn shaped word cards. Distribute one set around the classroom. Give each student one card from the other set. Students hunt for their matching words. Upon finding them, they read their words to the teacher or a classmate.

S/R 7. Bean Bag Toss: Write verbs on popcorn shapes. Place them in random fashion on the floor. Have student toss a beanbag onto one of the words and use it in the pattern. For example:

"Popcorn puffing"

R/W 8. a) Poem Building: Place a transparency like that shown below on the overhead. Have individual students (volunteers only) complete the poem. Be sure that the pocket chart model and other verb cards are available for reference.

Popcorn _____

Popcorn _____

_____ _____

Pop! _____ Pop!

b) Prepare a worksheet in the same manner as you did the transparency. (You may wish to have several verses available for students to complete.) Have students work individually or in pairs. Have them present their finished product to their classmates.

Application

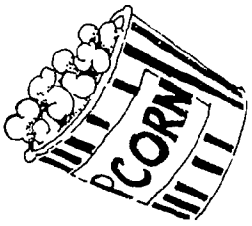
1. Have students pretend to interview a piece of popcorn to find out how it feels to be heated up.

2. Have students illustrate different actions of popcorn. Add arms, legs, and humourous expressions to the popcorn.

"Popcorn dancing"

3. Word Factory: Have students combine words from the chart developed in CD#1c) to make new words. Try the new words in the poem. For example:

   exploding + crackling = explocking -- Popcorn explocking!



CULMINATING ACTIVITIES

1. Chant "Who Stole the Popcorn?" as a chain drill. The teacher begins, using the name of the student sitting next to him/her. That student joins in the chant, then starts it again with the name of the student next to him/her. For example:

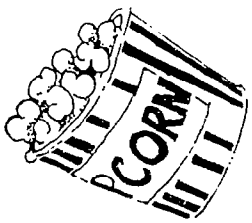
All: "Who stole the popcorn from the popcorn bowl?"
Teacher: "Sarah stole the popcorn from the popcorn bowl."
Sarah: "Who me?"
Teacher: "Yes, you."
Sarah: "Couldn't be."
Teacher: "Then who?"
Sarah: "Johnny stole the popcorn from the popcorn bowl."
Johnny: "Who me?"
Etc.

Write the chant on sentence strips and place in the pocket chart. Write students' names on cards. Have students insert the name cards in appropriate spaces as they chant. For example:

Who stole the popcorn from the popcorn bowl?
Sarah stole the popcorn from the popcorn bowl

2. Choral Speaking: Several of the poems listed at the back of this unit lend themselves to choral speaking. For students who are less fluent, try Pop! Pop! Pop!:

Group: "Pop! Pop! Pop!"
Student #1: "Pour the corn into the pot."
Group: "Pop! Pop! Pop!"
Student #2: "Take and shake it 'til it's hot."
Group: "Pop! Pop! Pop!"
Student #3: "Lift the lid - what have we got?"
Group: "Pop! Pop! Pop!"
All: "POPCORN!"



For students who are more fluent, Popcorn Song is a good choice:

Group: "Pop-pop-pop,"
Student #1: "Says the popcorn in the pan;"
Group: "Pop-pop-pop,"
Student #2: "You may catch me if you can."
Group: "Pop-pop-pop,"
Student #3: "Says each kernel, hard and yellow;"
Group: "Pop-pop-pop,"
Student #4: "I'm a dancing little fellow."
Group: "Pop-pop-pop,"
Student #5: "How I scamper through the heat."
Group: "Pop-pop-pop,"
Student #6: "You will find me good to eat."
Group: "Pop-pop-pop,"
Student #7: "I can whirl and skip and hop."
Group: "Pop-pop-pop-pop."
All: "POP! POP! POP!"

3. Brainstorm words that begin with the letter "P." Write triplets about popcorn using these words. For example:

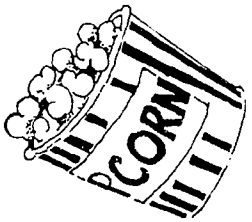
Popcorn
Puffs
Prettily

4. Brainstorm words that describe how popcorn smells, tastes, sounds, feels, and looks. Record words on a chart as shown below:

SMELLS	TASTES	SOUNDS	FEELS	LOOKS
salty	yummy	crackling	light	like snow
delicious	salty	sizzling	fluffy	cloudlike
Etc.				

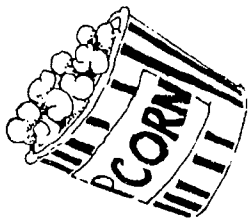
Write the word 'popcorn' at the top of the chalkboard. Have students choose one word from each column. Write these below the word 'popcorn':

Popcorn
Delicious
Salty
Sizzling
Fluffy
Cloudlike
Popcorn



Play around with the words, adding different ones or putting them in a different order, until you are pleased with the rhythm and sound of the poem. Write the poem on a large popcorn shape. Have students work in small groups to brainstorm other words and write their own popcorn poems.

5. Have a Popcorn Party: Write invitations to parents on popcorn shaped cards. Decorate the classroom with popcorn chains. Make a variety of popcorn treats. Present poems that were learned in Activity #2 (above). Display books, art projects, charts, etc. that were produced during the unit.



EVALUATION ACTIVITIES

It is important to assess what your students have learned during this unit. The following activities evaluate language and concepts.

You can do them orally (in small groups or with individuals) to test listening and speaking or on paper to test reading and writing. These are only suggestions; you can substitute different content or vocabulary items to make them more appropriate for your students. You probably will want to include many other activities as well.

1. Tell or give the students four or five words or phrases. Have them indicate which do not belong

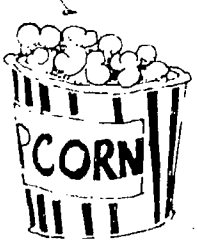
   solid: popcorn, chalk, salt, water, chair

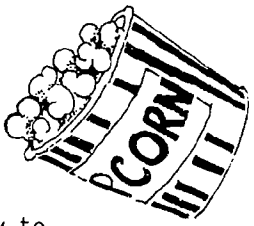
2. Tell or give the students sentence beginnings to match to sentence endings.

Red and blue are words that	describe texture.
Big and small are words that	describe weight.
Round and square are words that	describe colour.
Hard and soft are words that	describe size.
Rough and smooth are words that	describe shape.
Heavy and light are words that	describe hardness.

3. Tell or give the students the beginning of a sentence and a number of possible sentence endings. They indicate which sentence endings are appropriate for the sentence beginning.

A solid is something that has	a texture a size a colour a mother a shape
You can change some solids by	heating them crushing them adding water to them watching them stretching them cooling them
Popcorn is	fluffy. white. yummy. black.

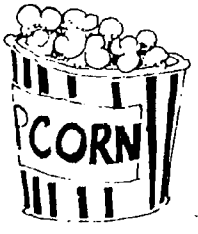


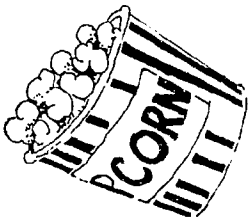


4. Tell or give the students a description of a solid. They try to guess what object the description fits.

   It is a solid. It is round. It is light. It is smooth. It is white. You use it at recess (A ball.)

5. Give students a set of photographs that show the various stages of making popcorn. Have them put the photos in the correct sequence and describe (orally or in writing) the steps involved in the process.





Popcorn Poem
Author Unknown

Popcorn's a snack food that's good for you.
It has fibre and protein and vitamins too.
If you leave off the butter, the calories are low,
And it's such fun to pop, you know!

Popcorn Fun
Mabel Watts
Source Unknown

Find the can of popping corn,
And pour some in your popper...
Hold it right above the flames,
Then shake it good and proper!

Pop and hop, and soon you will see
The first white popcorn ball;
Pop and hop - up to the top,
Till there's enough for all.

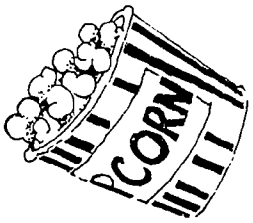
Now sit around the crackling fire,
Forget about the weather.
Eat and have a jolly time,
With everyone together!

My Favourite Snack
Mabel Watts
Source Unknown

Popcorn's very good to eat
No matter where you are -
At the circus, on the train
Or riding in a car.

It's popcorn at the matinee
And popcorn at the fair,
And when I'm working in the park
The Popcorn Man's right there.

He puts my popcorn in a bag
He fills it to the brim -
And off I go to share it
With Bill and Tom and Jim.



A Popcorn Song

(Sing to the tune of "Sing a Song of Sixpence")
Nancy Byrd Turner
Source Unknown

Sing a song of popcorn
When the snowstorms rage;
Fifty little brown men
Put into a cage,
Shake them till they laugh and leap
Crowding to the top,
Watch them burst their little coats,
Pop! Pop! Pop!

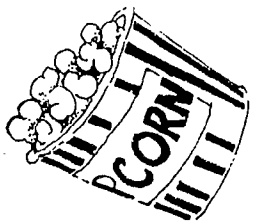
Sing a song of popcorn
In the firelight;
Fifty little fairies
Robed in fleecy white,
Through the shining wires
See how they skip and prance
To the music of the flames,
Dance! Dance! Dance!

Sing a song of popcorn
Done the frolicking;
Fifty little fairies
Strung upon a string
Cool and happy, hand in hand,
Sugar spangled, fair;
Isn't that a necklace fit
For any child to wear?

Popping Corn Song

Author Unknown

Bring a yellow ear of corn, then rub, rub, rub,
Till the kernels rattle off the nub, nub, nub;
Put them in a popper made of wire, wire, wire,
And shake the little popper o'er the fire, fire, fire!
If you find them gettin lively, give a shake, shake, shake,
And a very merry clatter they will make, make, make,
Soon you'll hear the heated grains go pop, pop, pop,
All about the little popper as they hop, hop, hop!
When you see the yellow corn turn white, white, white,
You may know the popcorn is just right, right, right.
When the popper gets too full, you may know, know, know,
That the fire has changed your corn to snow, snow, snow!
Turn the snow into a dish, for it's done, done, done,
Then pass it round and eat it, - oh what fun, fun, fun!



Popcorn!
Author Unknown

We pour the oil into the pan,
And then switch on the heat.
We add the kernels, small and hard;
Oh, this will be a treat!
Suddenly, one pops - and then
Pop! Pop! All around.
The kernels become popcorn;
Then gently settle down.

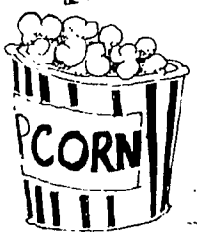
Lines 1 and 2 - Pantomime actions of pouring oil and turning on stove.
Lines 3 and 4 - Students form a tight circle and curl up tightly.
Line 5 - One student pops up from the floor and continues popping until the rest of the student join in on Lines 6 and 7. On the last line all the kernels should sit on the floor.

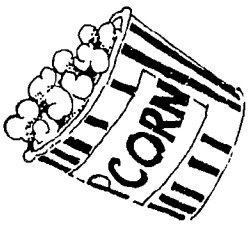
Popcorn
L.J. Bridgeman
Source Unknown

Hard and yellow,
See the fellow,
As he dances,
Jumps and prances,
Snaps his jacket,
Hear him crack it!
Now he's whiter,
Softer, lighter.

The Popcorn Party
Author Unknown

In little white dresses and little white pants
Girl fairies, boy fairies join in the dance,
One-stepping, waltzing, faster and higher,
On a floor made of holes, over red and gold fire!





Popcorn Land
Elsie F. Kartack
Source Unknown

One day we took a journey,
Down into popcorn land,
To see the popcorn children
And hear the popcorn band.

The children all lay sleeping
Wrapped in their blankets brown,
The wire cradle rocked them
Quite gently up and down.

The band awoke them playing
With a gay and tuneful pop.
Then each one jumped up quickly
To join the noisy hop.

Their dresses white and fluffy
Spread airy sails around
As they danced, and skipped, and floated,
To the pop-pop-popping sound.

Popcorn
Words by D. Pike, Bonnie Simpson

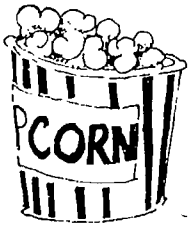
You put the oil in the pot
And you let it get hot.

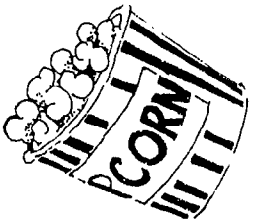
You put the popcorn in
And you start to grin.

Sizzle, sizzle, sizzle, sizzle
sizzle, POP!

I'm a Little Kernel
(Sing to the tune of "I'm a Little Teapot")
Author Unknown

I'm a little kernel in a pot,
Heat me up and watch me pop.
When I get all fat and white, I'm done,
Popping corn is lots of fun.





Ten Popcorn Kernels
Adapted from "Ten Fat Sausages"
From: Okki-tokki-unga
A&C Black, London, 1979
Adapted by C. McGregor

Ten popcorn kernels sizzling in the pan
Ten popcorn kernels sizzling in the pan
One went POP and another went BANG.
There were eight popcorn kernels sizzling in the pan.

Eight .....

Six.....

Four.....

Two popcorn kernels sizzling in the pan
Two popcorn kernels sizzling in the pan
One went POP and another went BANG
There were no popcorn kernels sizzling in the pan.

Pop, Pop, Pop
Louise Binder Scott
Source Unknown

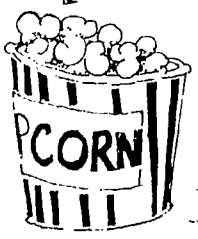
Pop, pop, pop, pop
Pop, pop, pop!
Listen to the popcorn pop!

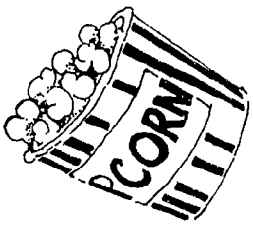
The little yellow grains
Are dancing in the heat
And when the pan is full,
We will all have a treat!

Repeat chorus

Soon the pan is filled
With snowy grains of white
We'll put some butter on
And we'll all have a bite.

Repeat chorus





I Like Popcorn

M. Gilmour

I like popcorn.
Hot popcorn,
Buttered popcorn,
Salty popcorn, too.
I like popcorn.

I like popcorn.
Popcorn in a pot,
Popcorn in a ball,
Popcorn in a bag,
Any way at all!
I like popcorn.

Popcorn

(Sing to the tune of "The Farmer in the Dell")

M. Gilmour

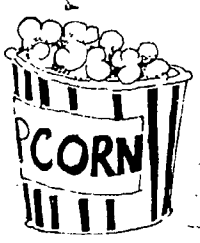
The popcorn's in the pot,
The popcorn's in the pot,
Watch out, it's getting hot,
The popcorn's in the pot.

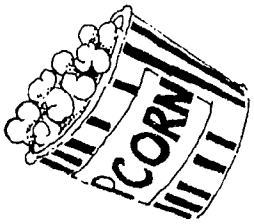
The popcorn's in my tummy,
The popcorn's in my tummy,
Oh wow, it's really yummy,
The popcorn's in my tummy.

Who Stole the Popcorn?

Adaptation of "Who Stole the Cookies From the Cookie Jar?"

All: "Who stole the popcorn from the popcorn bowl?"
#1: "_____ stole the popcorn from the popcorn bowl."
#2: "Who, me?"
#1: "Yes, you!"
#2: "Couldn't be!"
#1: "Then who?"
#2: "_____ stole the popcorn from the popcorn bowl."
#3: "Who, me?"
#2: "Yes, you!"





Popcorn
Author Unknown

Pop the popcorn
Pop the popcorn
Pop it in the pot.

Pop the popcorn
Pop the popcorn
See the popcorn pop.

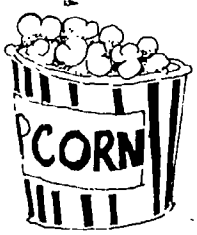
Pop the popcorn
Pop the popcorn
Eat the popcorn hot!

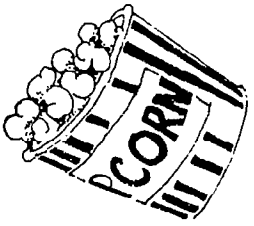
Pop, Pop, Pop
(Sing to the tune of "Row, Row, Row Your Boat")
Author Unknown

Pop, pop, pop the corn
Pop it big and white
Popping, popping, popping, popping
Until it is just right!

Popcorn
(Sing to the tune of "Frere Jacques")
Adapted by JoAnne Deal Hicks
Source Unknown

Pop, pop, pop-ping. Pop, pop, pop-ping.
Our popcorn, our popcorn.
Popping, popping popcorn. Popping, popping popcorn.
Our popcorn, our popcorn.





PEANUT BUTTER POPCORN BALLS
Adapted from "The Little Red Hen"
By M. Gilmour

Sarah loved to eat. One of her favourite things to eat was popcorn. One day, she decided to make some peanut butter popcorn balls. She found some peanut butter in the cupboard but she couldn't find any popcorn. So she said to her sister and brothers, "I'm going to make some peanut butter popcorn balls. Who will go to the store to buy some popcorn?"

"Not I," said her big sister.

"Not I," said her big brother.

"Not I," said her little brother.

"Then I will," said Sarah. And so she did.

When Sarah came home from the store she asked, "Who will help me pop the popcorn?"

"Not I," said her big sister.

"Not I," said her big brother.

"Not I," said her little brother.

"Then I will," said Sarah. And so she did.

When Sarah had popped the popcorn she asked, "Who will help me mix the peanut butter?"

"Not I," said her big sister.

"Not I," said her big brother.

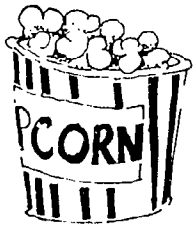
"Not I," said her little brother.

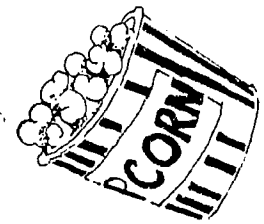
"Then I will," said Sarah. And so she did.

When Sarah had mixed the peanut butter she asked, "Who will help me make the popcorn into balls?"

"Not I," said her big sister.

"Not I," said her big brother.





"Not I," said her little brother.

"Then I will," said Sarah. And so she did.

When Sarah had made all the popcorn into balls she asked, "Who will help me eat the peanut butter popcorn balls?"

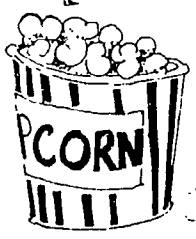
"I will!" said her big sister.

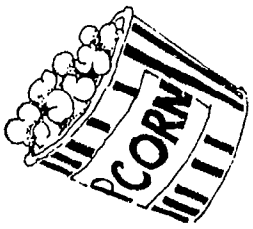
"I will!" said her big brother.

"I will," said her little brother.

"No, you will not!" said Sarah. "All by myself I went to the store to buy popcorn. All by myself I popped the popcorn. All by myself I mixed the peanut butter. All by myself I made the popcorn into balls. And all by myself I am going to eat the peanut butter popcorn balls!" And so she did!

Note: For teaching activities that could be used with this story refer to the lesson "Who Will Help Me?" from the Berry Picking unit, Department of Education, 1984.





POPCORN RECIPES

Peanut Butter Popcorn Balls

2 L (8 c.) popcorn
1/2 stick margarine
1 pkg. marshmallows
200 ml (3/4 c.) peanut butter
125 ml (1/2 c.) wheat germ
125 ml (1/2 c.) chocolate or carob chips

1. Place all ingredients except popcorn in a pot and stir over low heat until melted.
2. Pour mixture over popcorn. Butter your hands and form balls.

Gelatin Popcorn Balls

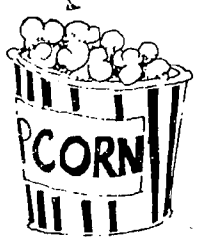
250 ml (1 c.) light corn syrup
125 ml (1/2 c.) sugar
1 pkg. fruit flavoured gelatin
250 g (1/2 lb) peanuts
2 L (8 c.) popped corn

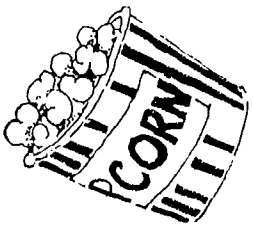
1. Bring the sugar and syrup to a boil.
2. Remove from heat and stir in gelatin.
3. Add the peanuts and pour the mixture over the popcorn.
4. Form into balls.

Caramel Corn

400 g (14 oz.) of caramels
30 ml (1/8 c.) of light corn syrup
15 ml (1 tbsp.) water
1.5 L (1 quart) popcorn

1. Melt all ingredients (not popcorn) in the top of a double boiler.
2. Pour over the popcorn and form into balls.





Honey Popcorn

125 ml (1/2 c.) honey
60 ml (1/4 c.) margarine
1.5 L (6 c.) popped corn
250 ml (1 c.) shelled peanuts

1. Heat honey and margarine and stir until well blended.
2. Cool mixture and pour over popcorn and peanuts. Stir well.
3. Spread mixture in a pan and bake for 5 to 10 minutes in a 175°C (350°F) oven. Stir several times until crispy.
4. Spoon into large bowl.

Yummy Yogurt Popcorn

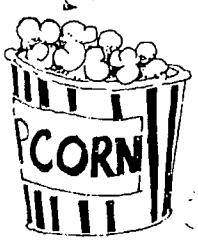
2.25 L (2 1/2 quarts) popped corn
250 ml (1 c.) plain yogurt
250 ml (1 c.) brown sugar
80 ml (1/3 c.) light corn syrup

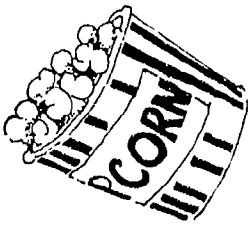
1. Combine yogurt, brown sugar and corn syrup in large saucepan. Cook and stir over medium heat until it reaches hard ball stage 125°C (250°F) on candy thermometer).
2. Pour over popcorn and stir to coat.

Orange Honey Popcorn

6 L (5 quarts) popped corn
250 ml (1 c.) shelled sunflower or pumpkin seeds
125 ml (1/2 c.) melted butter
125 ml (1/2 c.) honey
15 ml (1 tbsp.) shredded orange peel
1 ml (1/4 tsp.) grated nutmeg

1. Place popcorn and seeds in large bowl.
2. Combine other ingredients and pour over popcorn. Toss to mix.
3. Bake in preheated 150°C (300°F) oven for 15 minutes. Stir occasionally.





Holiday Popcorn Mix

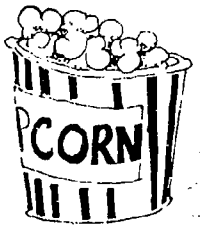
3 1/2 L (3 quarts) popped corn
1 can cocktail peanuts
250 ml (1 c.) dried apricots, chopped
125 ml (1/2 c.) seedless raisins
200 ml (3/4 c.) light corn syrup
60 ml (1/4 c.) firmly packed light brown sugar
15 ml (1 tbsp.) vanilla extract
3 ml (1/2 tsp.) salt

1. Toss together popcorn, peanuts, apricots and raisins.
2. Blend corn syrup, brown sugar, vanilla and salt. Pour over popcorn mixtur e and toss to coat.
3. Place on buttered pan and bake in preheated 250°F oven, stirring occasionally.

Cheesy Corn

250 ml (1 c.) grated cheese
125 ml (1/2 c.) melted margarine
5 ml (1 tsp.) salt
4 1/2 L (4 quarts) popped corn

1. Mix cheese, margarine and salt.
2. Pour mixture over popcorn. Toss to coat.

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