

# The Popcorn Shop!

Science, Mathematics and Social Sciences, Level 1 and 2

## The Learning Context:

After investigating the properties of corn and corn products, students will focus on popcorn, working co-operatively to make popcorn for the market place using a range of flavours.

During the first stage of the unit students will explore, observe and describe the physical properties of a range of corn products and understand how one of those products, popping corn, can be changed into popcorn by heating. Students will also explore how flavour changes when different additives are combined with the popcorn.

Students will undertake a statistical survey in their class to determine which popcorn flavours are the most popular and make predictions of what they might find when they survey another class to determine which of their flavours they deem to be the most popular.

Students will explore the costs of producing popcorn and consider what price they should sell their popcorn to cover their costs, then to make a profit so that they can eat popcorn 'free' for a day.

In groups, students will produce popcorn to sell at their stall, selling to other students in their school. Students will work within a budget and timeline, plan and prepare the popcorn, and present their product in an attractive and hygienic way. Students will also learn how to give change.

Once the popcorn stall has been held students will reflect on its success using feedback from their customers (consumers) as one way of identifying their achievements.

This unit is also suitable for Level 2, with minor changes to the achievement objectives.  
Approximately 14 lessons

## Achievement Objectives:

### SCIENCE CURRICULUM: Level 1

#### Participating and contributing:

Bring a scientific perspective to decisions and actions as appropriate as they ...

**Material World – Properties and changes of matter:** Observe, describe, and compare physical and chemical properties of common materials and changes that occur when materials are mixed, heated, or cooled.

#### Material World – Chemistry and society:

Find out about the uses of common materials and relate these to their observed properties.

### MATHEMATICS AND STATISTICS CURRICULUM

Statistical investigation

Conduct investigations using the statistical enquiry cycle by:

- posing and answering questions
- gathering, sorting and counting, and displaying category data
- discussing the results.

### SOCIAL SCIENCES CURRICULUM: Level 2:

Understand that people have social, cultural, and economic roles, rights, and responsibilities.

## Enterprising Attributes:

- Collecting, organising and analysing information
- Generating, identifying, and assessing opportunities
- Working with others and in teams
- Monitoring and evaluating
- Planning and organising

Teachers to observe and collect evidence of these enterprising attributes in action.

## Resource Requirements:

Ready to Read Text: 'Pop! Pop! Pop!' (orange level)

- Making Better Sense of the Material World, Levels 1–4 Ministry of Education.
- Products made out of corn
- Local theatre to see popcorn being made
- Classroom shop which sells ingredients to make flavoursome popping corn
- Popping corn and a range of 'flavours', eg: ...
- Equipment to prepare and present popcorn, eg: bowls, airtight containers, plastic cups, etc
- Decision Making Grid
- Yahoo or Google search, search words such as: corn, popping corn, popcorn flavours, etc
- Cash book

## Learning Outcomes:

Students will be able to:

1. Describe and group different types of corn products, using observable physical properties.
2. Describe, from observation, how popping corn changes physically as it is heated in the microwave.
3. Trial and compare a range of flavours for popcorn using statistical enquiry.
4. Work co-operatively in a group to make and package a range of popcorn flavours, taking responsibility for an allocated role.
5. Describe their role as both producers and consumers, and the responsibilities for each of those roles.
6. Describe how they applied Enterprising Attributes to support their tasks in this unit.

## Teaching and Learning Sequence

NB: Teachers are encouraged to gauge the prior knowledge of their students before implementing each unit so that they can provide personalised and meaningful learning opportunities. The teaching and learning sequence provided in each unit is to be viewed as a guide only. Teachers will need to adapt this sequence to meet the needs of their students, school and community.

The Future Focus issues of Citizenship, Enterprise and Globalisation can be explored during this unit. As students investigate corn and the products derived from it, they may wish to consider where these products come from (from labels) and why they end up in New Zealand. This unit is very much about enterprise and economic entrepreneurship. It is also about peoples' responsibilities as citizens, to work, and to provide goods and services to others.

The numbered activities listed below are learning steps rather than lessons. Teachers may choose to combine two or three learning steps into one lesson. Alternatively, they may spread one learning step out over several lessons. This will be largely dependent on students' prior knowledge and their subsequent learning needs.

### Getting started:

The teacher brings to the classroom two flavours of popcorn for students to taste and carries out a simple statistical survey to see which flavour students like best. Results are recorded on a pictograph? and displayed on the wall.

The unit and focus for learning is described to the students. Explain that the class will:

- Investigate what food is made out of corn, and taste some of these products
- Explore the popcorn making process and test out a range of popcorn flavours to see which are the most popular
- Work in co-operative groups to make popcorn and sell it to other children at the classroom stall
- Buy some popcorn too, if they make money from their enterprise.

The class creates a timeline for the unit with key dates for critical actions. This process will make the teaching sequence of the unit explicit to the students.

### LINKS TO BES Best Evidence Synthesis

5. Quality teachers create effective and sufficient learning opportunities.

6. Quality teachers plan a range of activities that engage students, enabling them to complete the learning process, so what is learned is remembered.

**Exploring Science:**

1. The teacher and students complete a brainstorm to record students' prior knowledge about corn and popcorn. Prompt questions could include: What makes popcorn? What vegetable is it? What colour is it? What does the vegetable look like? When and where is it grown? What things can we make from this vegetable? What else might you snack on instead of popcorn? Teacher records students' ideas on a flip chart under two headings, "What is corn?" And "What do we eat that has corn in it". Pictures are added where possible.
2. Students investigate various types of food products made out of corn. They study their texture, taste, smell, colour, use (as a yummy treat or otherwise), how is it stored. Some examples to investigate are corn on the cob, cream corn, corn chips, frozen corn, popcorn, corn oil, corn kernels, etc.

Record all relevant comments and observations on a chart like the following one using both word and pictorial presentation where appropriate: (Learning Outcome 1)

Properties Product type:	What colour is it?	How does it look?	How does it smell?	How does it taste?
1 – cream corn				
2 – corn oil				
3 - corn chips				
4 – corn on the cob, etc				

Teachers add new information under the two key questions on the flip chart.

3. Students re-visit the chart produced at step 2 and reason why each type of corn product is different. Explain to students that corn is a very important ingredient in a whole range of products for both food and non food items. People at work change corn into these products and then sell them to us as consumers. And in this activity students will work too, buying corn kernels (popping corn) from their classroom shop and changing it into popcorn to sell to consumers. ( LO 1)
4. Using the class's business start-up grant of \$20.00, the students buy popping corn, e.g. 50 gm for 20 cents from the classroom shop, and record the price paid in their classroom cash book. (See template for classroom cash book to record this purchase, NB opening balance of \$20 start up capital.) Classroom cash book is displayed on the wall. Students act out the role of customer (consumer) and seller in all transactions with teacher guidance. Have the seller weigh 50 gm, and then exchange the corn for 20 cents. Students recall their buying and selling process for purchasing their popcorn and this is recorded on the class's flip chart, under a heading such as Going Shopping. **Innovation, inquiry, and curiosity**

**3. Quality teachers recognise and build on students' prior knowledge.**

**4. Quality teachers use the existing effective models as defined in science.**

**9. Quality teachers promote sustained thoughtfulness through questioning approaches, wait time and create opportunities for application and creativity.**

5. The teacher asks students about how this popping corn can be turned into popcorn? Students may have seen popcorn made in a popcorn maker, in a saucepan or in a microwave. Firstly the students pop the corn in the microwave using the recipe below or another of the teacher's choice. The finished product is measured again in terms of cup size, and recorded.  $\frac{1}{4}$  cup popping corn = xxx cups of popcorn!! The students also reweigh the popcorn from the quarter cup and record the new weight. 50 gm popping kernels = xx gm of popcorn. Findings are recorded on the classroom flip chart and the popcorn is sampled. Ask the students to investigate why popcorn pops for homework and to consider why the popped corn is lighter. (Caregivers may want to look it up on the internet!)

**Recipe**

To pop corn in a microwave, put about a quarter cup of corn on a paper plate, cover with another paper plate and cook on high for two to three minutes, until most of the popping stops.

6. Students draw what they think is happening inside the microwave as the corn pops. Encourage the students to understand that the corn has changed into popcorn because the moisture in the corn has heated to a point (200 degrees C) where the steam has burst out of the shell of the corn. Use the words 'solid', 'steam' and 'light' and 'fluffy' during these discussions. (Learning Outcome 2)

**Statistical investigation**

7. Create a frequency chart recording students' assessment of the taste of plain popcorn, using the criteria, Just OK, Nice, Yummy. Discuss what story the chart is telling the class. Ask students, do they know of ways of getting everyone to say popcorn is Yummy?!! What flavours can be added to popcorn to make it more appetising to all people? What flavours do students like? What flavours have we not thought about? **Generating, identifying, and assessing opportunities**  
<http://www.popcornpalace.com/index.cfm?fa=prod.flavors> is a great site for some additional ideas on flavours.

8. Teacher sources a range of flavours to test out in the classroom, making sure that not all of them are 'yummy', e.g. introduce one like chilli flake popcorn, etc. The students purchase more popping corn from the shop to test out each flavour, using  $\frac{1}{4}$  cup for each flavour. (Or the teacher may prepare the flavoured popcorn in advance if time is a constraint). Set up 'testing stations' for each of the flavours around the room which students will rotate around. Demonstrate a chart where students can record their reaction to a flavour using a number - zero to three. Explain the number system carefully to students, zero being 'Awful', and three being 'Yummy'. Engage the services of some older students to help with the taste testing and recording of the information using a tally marks. (The older children might come up with an orderly way of undertaking the testing, linking into their own statistics learning.) The chart below is useful for recording the aggregated data. The numbers in the left hand column will tell the viewer how many '0's have been recorded, '1's recorded and so on. The older students / teacher may wish to present this information in a chart. Learning Outcome 3 **Collecting, organising and analysing information** **Innovation, inquiry, and curiosity**

Popcorn Flavours	0 Awful	1 Just ok	2 Nice	3 Yummy
Caramel				
Chilli				
Salt				
Cheese				
Strawberry				

2. Quality teachers teach students how to work collaboratively and facilitate active learning in the classroom.

7. Quality teachers encourage critical thinking.

6. Quality teachers encourage students to learn as a community.

9. The students talk about what are the best flavours if they are making the popcorn for themselves. Students then ask, "Would older students agree with our findings?" Students predict an outcome. Their prediction is recorded.
10. Students carry out this same survey in another classroom using the same templates and helpers from the senior school. They communicate their findings to the class, and tell them about their popcorn shop they are going to set up, inviting these students to be their consumers. LO 3.

### The Economic World

11. The students find out about producers. The teacher and students visit the local theatre or another local shop that makes popcorn to find out how they make it and what different flavours they offer. Students also look at the packaging and price of this popcorn. Students record what they found out when they get back to school. They may also consider using a popcorn machine or the saucepan method to make popcorn.
12. Students as the 'producers' consider who their customers will be and with teacher guidance establish 'success criteria' for their Popcorn Shop. Students find out about the role of consumers in the Economic World.  
**Excellence**
13. The students make final decisions about what flavours they will produce and in what size packaging. They also discuss how they will package their popcorn. Using a Brainstorm Grid, students as a class place their packaging ideas along the top row. The teacher provides practical examples of each of the packaging ideas so students can see what it would look like. They then consider what is important for their packaging, e.g. looks good for the customers, easy to hold, keep's popcorn clean, and so on. These ideas are recorded in the left hand vertical column. Students discuss each of the packaging ideas against each of these 'criteria' and decide whether it's a good packaging idea or a bad one. Students' thoughts can be recorded. Teacher can use show of hands to record responses for each packaging type against a criteria using; Awful idea, OK idea, Great idea. Students decide how they will package their popcorn.
14. With assistance from the teacher, students plan how they will organise their popcorn factory. Breaking up the tasks into action steps, for example, weighing, cooking, making packaging, packaging, advertising, etc and perhaps rotating through the tasks to manufacture their popcorn. A trial run is fun! Monitoring performance and looking for ways of working better next time. Students work in teams as they rotate through each of the jobs. Job descriptions are recorded for each of the tasks. NB: Lessons on co-operative work may be required if students are not used to working in groups. The teacher should encourage students to identify problems or issues they can see arising in their factory and how they might reorganise it. **Planning and organising** **Monitoring and Evaluating**
15. Students purchase the required ingredients from their classroom shop. The costs are recorded on the classroom's cashbook and manufacturing begins, including manufacturing the packaging and packing popcorn. Students take photographs of themselves working in their popcorn factory. Learning Outcome 4. **Working with others and in teams**
16. Students discuss where they will sell (distribute) their popcorn from (market place), e.g. their classroom, a stall in the playground, etc, and also discuss who their customers are going to be. They also discuss advertising and what that might look like. Students prepare signage for their stall and advertising for their potential customers, as one of the

**10. Quality teachers involve students in the process of setting specific learning goals.**

**2. Quality teachers encourage learners to work as a community.**

tasks. **Planning and organising** **Working with others and in teams**

17. Students total the expenditure they have incurred in testing and making their popcorn, and count the number of packets they have made. Students consider the price for each packet, first to break even, then to make a profit. Students consider if their price is too cheap, about right, or too expensive given their experiences. A price is determined, and price tickets are made / included on the advertising material. NB: It may be necessary to set the price at a whole dollar amount for easier change calculations – this will be dependent on students' mathematical abilities. **Monitoring and evaluating**

18. Students practice selling and giving change. **Integrity**

### **Sharing and Evaluating:**

19. Students open "The Popcorn Shop" and sell their treats. While some are sellers, others are customers. Through a pre planned roster, all students have a chance to buy and sell. (Remember to have the camera to record the experience.)
20. The money is counted from their sales, and the teacher is paid back the business start up grant. Students also subtract their expenses incurred at the classroom shop. The difference is the profit. If there is a profit, students can produce popcorn and 'eat it free', or they may wish to buy something for their classroom with it, etc.
21. Students draw a picture of their shop with customers buying popcorn, and add to this picture the three words of consumer, producer and distribution.
22. Students use the "success criteria" that they drew up at step 12 to evaluate their success in running their popcorn shop. Students ask for feedback about their popcorn and service from their customers. Students then identify the strengths of their business and areas for improvement.
23. Students reflect on their roles as producers and consumers, and discuss the responsibilities each of these roles has. (Learning Outcome 5)
24. Students re-visit the brainstorm written up at step 1 of the unit and add their new knowledge about corn, popcorn and setting up a business.

**5. Quality teachers engage students in real life learning.**

**10. Quality teachers utilise assessment to improve learning.**

**Reflective Questions:**

Exploring new knowledge and skills – Social Science

- When were you a consumer in this activity? When were you a producer? Where and how did you get the two groups of people together?
- Why do you think people work and what do you think they do at work?
- Where does money come from for you to be a consumer? Where does your Mum/Dad get the money from? What do they do for it?
- What do you see in a market place? What is fun about going to a market?

Exploring what it is to be innovative and enterprising

- How could you improve on using the Enterprising Attribute/s for next time? Learning Outcome 6
- How could you transfer this learning to your other topics?

Exploring further future focus issues

- What would happen to some of the goods in the supermarket if there were no planes and ships to bring things from other countries?
- What do we gain if we work and sell popcorn? Is this the same as our caregivers?

**Possible Assessment Activities (Teacher):**

Learning Outcome 1: Students list or draw a range of corn products and describe how they are different from each other.

Learning Outcome 2:

**Science Exemplar and Progress Indicators – Level 1:** (available on-line) Investigating Science.

Students are asked to draw a picture that illustrates what popping corn looks like, and describe its physical properties. Then to illustrate how it changes into popcorn, describing the physical properties of popcorn.

Learning Outcome 4: The teacher could evaluate how well each student participates in the popcorn factory and how they carry out their allocated role/responsibility.

## The Popcorn Shop - Enterprising Attributes

Task	Enterprising Attribute/s NB There may be more than one answer! (These to be removed when using this sheet)
We had to think about lots of ideas for flavours for our popcorn and see if people would like them	
We asked people to taste our popcorn and tell us which flavour they liked.	
We worked out how to set up our Popcorn factory and who would do the tasks to be done.	
We all had to get stuck in to doing all the work, and we worked in groups, one group cooking, one group creating the packaging, another filling up the packages, etc.	
We recorded our purchases in our cash book and worked out how much we had spent and how much we would have to charge for popcorn to make money.	



## Decision Grid

Criteria	Choice 1	Choice 2	Choice 3	Choice 4	Choice 5	Choice 6	Total

# Cash Book

Business Name:

Date:	Details:	\$ Deposit	\$ Withdrawal	\$ Balance