

## Curriculum grid

Activity	Key Stage 3 curriculum reference
Drinks survey	Ma4 1, 2, 3, 4, 5
Taste testing	Ma4 1, 2, 3, 4, 5
Packaging and unit cost	Ma2 1a
Measuring the amount of juice in a fruit	Ma2 e, f Ma3 ICT 2d
A lot of bottle?	Ma2 1a Ma3 4g

## Activity 1 – Drinks survey

(Series of three lessons)

### Learning objective

Students to plan and carry out a survey, and interpret and present their results, and start to evaluate the processes involved.

### Key vocabulary

primary data, secondary data, target audience

### Organisation

Group work

### Resources needed

Advertisements/selection of soft drinks

### Introduction

Show the class a selection of drinks advertisements or soft drinks. Discuss with the students if there is a correlation between the age of people and their choice of drink. Do drinks manufacturers target specific age groups? How do they do this? Is it successful? How might they find out?

### Activity

#### Lesson 1

Students are to design a questionnaire that will provide data to see if there is a pattern/relationship between age and preference of soft drink. They should then be given time to collect data. SAFETY – reinforce that the questionnaires should only be given to people that they know and they are not to approach strangers.

Discuss sample size and data format. Discuss how they might use the data to turn it into usable information to inform their planning.

#### Lesson 2

The students are to process and present the data collected, and prepare a presentation.

#### Lesson 3 / Plenary

Each group is to present their findings, and justify how they presented their data. The class should then evaluate the processes involved.

#### Extension

Create a wall display of the project.

## Activity 2 – Taste testing

### Learning objective

Students to plan and carry out a survey, and interpret and present their results, and start to evaluate the processes involved.

### Key vocabulary

mouthfeel, sweetness, carbonation, colour, flavour

### Organisation

Testing and analysing data (group work)

Representing data (individual work)

### Resources needed

Selection of one flavour of commercially prepared carbonated drink, e.g. five different colas/lemonades, including some diet drinks  
Disposable cups  
Paper

### Introduction

Ask the students which drink from your samples they prefer. Ask them to explain why. What is it that makes you prefer X?

## Activity

In groups, students are to design a worksheet to use to collect data about drink preferences. They are then to set up a blind tasting session with the different drinks. They should then discuss if there is a relationship in the data collected – do people prefer diet/non-diet drinks? Is fizziness more important than colour? How could you represent this data?

## Plenary

Discuss the findings of the class.

## Activity 3 – Packaging and unit cost

### Learning objective

Students to select appropriate strategies and calculations to solve a problem.

### Key vocabulary

unit cost, multi buy, buy one get one free

### Organisation

Group work

### Resources needed

Per group:  
Worksheet with prices of a named drink (cost of bottles, cans, multipacks)  
OR internet access for comparing prices from supermarkets  
OR time built into lessons to allow research  
Paper cup  
Measuring cylinder  
(Optional) Empty drinks containers: 1 and 2 litre containers, cans (all of same drink)

### Introduction

Tell the students that you are holding a party for a class, but you haven't got much money. Could they help to find the cheapest way of providing a fizzy drink for everyone? Board blast where drinks are purchased, how they are packaged, special offers, etc.

### Activity

The students are to:

- find out how much drink each person will have using the paper cup
- work out how much they will need in total
- find out the cheapest way to buy the drinks (bottles, cans)

- find out whether offers such as 'buy one get one free' are available and what effect this will have
  - work out the unit cost for each per cup
  - display their findings.
- (This could be done as a practical investigation using cups and the containers.)

### Plenary

Discuss the class findings. Compare and evaluate the clarity of presentation of the data.

### Extension

Design a spreadsheet for the information.

## Activity 4 – Measuring the amount of juice in a fruit

### Learning objective

Students to use calculations to find the percentage of juice in a lemon and costs of ingredients.

### Key vocabulary

percentage

### Organisation

Practical (group work)  
Calculation (individual/group work)

### Resources needed

Bottle of still lemon drink (for demonstration)  
Lemons (at least two per group)  
Knife and chopping board  
Weighing scales  
Measuring cylinders  
Lemon squeezers  
The price of: lemons, a bag of sugar/artificial sweeteners  
Access to computers (for extension task)

### Risk assessment

Warn the students about taking care with the sharp knife. The juice should not be tasted unless prepared in a food preparation area with normal rules of hygiene adhered to.

## Introduction

Show the class the bottle of drink. Explain that the class is going to investigate the raw ingredients of a lemon drink, and to work out how much it might cost to make. The students are to try to find out:

- the percentage of juice in one lemon by weight
- the cost of 1 litre of pure lemon juice
- the cost of 1kg of sugar.

## Activity

(It is up to the teacher to decide how much input the class receives. It could be used as a problem solving exercise.)

The students are to weigh the lemon, choose a method to remove the maximum amount of juice from it, and measure the volume and weight of the juice produced. They should repeat this and find the mean volume of juice produced and the percentage of juice by weight.

The class can then research into lemonade recipes and try to work out the cost of the ingredients needed to make 1 litre of lemonade.

## Plenary

The class results should be collated. Discuss the need to use a large sample size.

## Extension

The students are to produce a spreadsheet with unit costs so that it can be used for different quantities and recipes. The students could also investigate the most effective methods of extracting the juice.

## Activity 5 – A lot of bottle?

### Learning objective

Students to practise estimation and extending work on volume.

### Key vocabulary

estimate, volume, area, formula

### Organisation

Group work

### Resources needed

Per group:

Measuring cylinder

Access to water/bottles of water

Assorted clean drinks containers of different shapes (at least four per group) with labels removed or volume information covered up but with price recorded on the container

### Risk assessment

Activity to be carried out away from electrical equipment

### Introduction

Show the class a can and a carton. Which contains the most drink? How could we work this out?

Calculate the volume using formulae. Show the class a different shaped bottle. What about this?

How could we work out the volume of this shape?

### Activity

Groups are to estimate the volume of each container. They are then to pour in 100ml of water using a measuring cylinder. From this, they should make a second estimate. They should then find out the actual volume by filling the container with water. The students should record their results in a table (see below).

Container	1st estimate	2nd estimate (after pouring 100ml into container)	Actual volume

The students should then try to work out which is the cheapest drink.

# Mathematics



## Plenary

Discuss the class findings.

## Extension

Calculate the area of the bottom of the container, and work out how many containers would fit in a bottle shelf in a refrigerator that measures 40cm x 15cm.