

# QCA-RSSCSE

## Data Handling and Statistics Project

### What's in your bowl?

#### Notes for PowerPoint Presentation

##### Objectives

Children should learn:

- to relate individual statistical techniques to a wider problem;
- to think analytically about a statistical problem;
- to apply a variety of techniques to solve a problem.

##### Slide 1



The PowerPoint presentation contains 28 slides. A number of these are either optional or used for transitions between the different sections (a map of the problem solving approach is used for this).

Two of the slides contain buttons which allow you to branch off and investigate particular options.

The PowerPoint slides require Microsoft PowerPoint version 2002 and above. If you have an earlier version, you can download software to view (but not edit) our files. The viewer can be obtained (free) from [www.microsoft.com/powerpoint/](http://www.microsoft.com/powerpoint/) (search for the key word "viewer").

Before this activity is presented, pupils could be asked to bring in details on Salt, Sugar, Fibre content from the side of their favourite breakfast cereal – easier if they can cut out the Nutrition Information panel.

##### Context

With the current drive toward a healthier younger generation, breakfast is branded as the most important meal of the day. This coincides with a recent introduction of a new food labelling system. This resource branches into two different options – one which encourages students to compare similar cereals nutritional values and the other considering how healthy peoples' breakfasts are.














# What's in your bowl?

## Objectives

Children should learn:

- the context of the problem;
- why breakfast is considered to be important
- that breakfast cereals are based on the four ingredients: rice, wheat, corn, oats.

## Slides 2 & 3

Plan	Collect	Process	Discuss								
<p><b>What's in your bowl?</b></p> <p>How many breakfasts can you name that contain..</p> <table><tr><td><b>Rice</b></td><td></td><td></td><td><b>Corn</b></td></tr><tr><td><b>Wheat</b></td><td></td><td></td><td><b>Oats</b></td></tr></table>				<b>Rice</b>			<b>Corn</b>	<b>Wheat</b>			<b>Oats</b>
<b>Rice</b>			<b>Corn</b>								
<b>Wheat</b>			<b>Oats</b>								
<p><b>What's in your bowl?</b></p> <p>Breakfast is really important!</p> <p>Just think - when you wake up in the morning, your last meal was probably more than <b>10</b> hours ago!</p>  <p>American doctors claim eating breakfast is the secret to staying healthy. They say skipping the first meal of the day increases the chances of becoming <i>obese</i> or developing <i>diabetes</i>.</p>											

Begin with a quick brainstorming session of the names of common cereals by type – this could be done by pupils having a short set time (two-minutes) to list as many as they can. This helps set the context of the problem – it is also useful to see how many variations of particular cereals they know such as Frosted and Chocolate versions.

What's your favourite?

Which do you think is the healthiest?

The third slide continues scene setting by introducing the importance of breakfast.

Why is breakfast the 'most important meal'?

Do you eat breakfast?

Do you notice anything if you don't eat breakfast?

Why could skipping breakfast increase the chances of getting diabetes/being obese?

You could also discuss the phrase "increase the chances of" – what does that mean? Does it mean you're certain to get diabetes?


# What's in your bowl?

## Objectives


Children should learn:

- the context of the problem;
- to ask questions about presented information;
- how commonly quoted statistics relate to a group of people.

## Slides 4 & 5

Plan	Collect	Process	Discuss
<b>What's in your bowl?</b>			
Cereals are the most popular breakfast in the UK.			
What percentage of your class have breakfast cereal in the cupboard at home?			
What is the average number of cereal packets that your class have at home?			
What portion of your class ate breakfast this morning?			
			

Plan	Collect	Process	Discuss
<b>What's in your bowl?</b>			
Cereals are the most popular breakfast in the UK - over 95% of households buy breakfast cereals.			
On average, each household has 5 packets of cereal (either opened or unopened) in the cupboards.			
Yet 1 in 5 children are skipping breakfast and going to school on an empty stomach!			
How does your class compare?			
			

Not all pupils have breakfast and even if they do it may not be cereal. However the vast majority of children of school age do eat cereals.

- Students can do a survey of the group, asking them 3 questions. And then do the calculations. This will be time heavy – but students are likely to enjoy collecting the data
- Have a class discussion to find out numbers of students in each category and get students to do the calculations – on their own, in pairs or in groups.
- Set up a spreadsheet on the board, input answers directly and set it up so that it automatically calculates the figures. Ask students to explain to their neighbour what the numbers mean and how the calculations work

The information on slide 5 comes from sources found on the Breakfast Cereal Information Service at [www.breakfastcereal.org/](http://www.breakfastcereal.org/)

Looking at your class statistics, how reasonable do you think the national statistics are?

Are there any questions you would like answering about the statistics?

For example : Who's results are they? How did they collect the data? What sort of average?

# What's in your bowl?

## Objectives

Children should learn:

- the context of the problem;
- to ask questions about presented information;
- the main nutritional groups
- to hypothesise.







## Slide 6

Plan	Collect	Process	Discuss
<b>What's in your bowl?</b>			
It's not just <i>eating</i> breakfast that's important... what's <i>in</i> your breakfast– the <i>nutritional content</i> of cereal is important too.			
Lots of doctors and dieticians are worried about what's in cereals that are popular with children.			
Which cereals are most popular with children?			
What might doctors and dieticians be worried about?			
What do you think these cereals contain ' <b>too much</b> ' or ' <b>too little</b> ' of?			

Food and its role in children's lives has become an important issue for the Government to tackle. There is now a website dedicated to this issue – see [www.foodinschools.org](http://www.foodinschools.org). With changes to school meals pupils should be aware of nutritional issues.

The first question can be used to initiate a quick discussion and hand count. The second question can also be used promote an interesting discussion however personal dietary habits can be a delicate matter to address – particularly if some of the class are showing signs of obesity – keep this pacy and general. Pupils might suggest excess levels of sugar, artificial additives and salt but are less likely to suggest too little fibre.

## Slides 7 & 8

Plan	Collect	Process	Discuss	
<b>What's in your bowl?</b>				
<b>Parts of a breakfast cereal</b>				
<b>Salt</b>	<b>Sugar*</b>	<b>Protein</b>	<b>Fat</b>	<b>Fibre Bran</b>
				
<b>*Carbohydrates</b> General term for all types of sugar (including starch) found in <b>wheat, oats, rice and corn.</b>				
				

Plan	Collect	Process	Discuss																														
<b>What's in your bowl?</b>																																	
<b>Parts of a breakfast cereal</b>																																	
<table border="1"><thead><tr><th colspan="2">Nutrition</th></tr></thead><tbody><tr><td>1</td><td>Energy</td><td>410g/100g</td><td>1670kJ</td></tr><tr><td>2</td><td>Carbohydrate</td><td>68g/100g</td><td>272kJ</td></tr><tr><td>3</td><td>Protein</td><td>12g/100g</td><td>480kJ</td></tr><tr><td>4</td><td>Fat</td><td>8.1g/100g</td><td>324kJ</td></tr><tr><td>5</td><td>Fibre</td><td>8.1g/100g</td><td>324kJ</td></tr><tr><td>6</td><td>Salt</td><td>0.1g/100g</td><td>4kJ</td></tr><tr><td>7</td><td>Sugar</td><td>10g/100g</td><td>400kJ</td></tr></tbody></table>				Nutrition		1	Energy	410g/100g	1670kJ	2	Carbohydrate	68g/100g	272kJ	3	Protein	12g/100g	480kJ	4	Fat	8.1g/100g	324kJ	5	Fibre	8.1g/100g	324kJ	6	Salt	0.1g/100g	4kJ	7	Sugar	10g/100g	400kJ
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7	Sugar	10g/100g	400kJ																														
Boxes always have info for 100g portions.																																	
Can you judge if the amount of <b>salt, sugar or fibre</b> is enough or too little/much from just this label?																																	
A new set of labels has been designed to help....																																	

The images will appear before the words, so you could ask the group to identify each of the images. Although important in the diet, minerals and vitamins are in low levels and are ignored on these slides. An important fact to be made here is that Sugar is a subgroup of Carbohydrates. White granular sugar is Sucrose (saccharose) and made from small sugar molecules. Large chains of linked sugar molecules are found in starchy foods – these require digestion inside the body before releasing energy – and are called Complex Carbohydrates.

Legal requirements for food labelling can be found at [www.food.gov.uk/foodlabelling/](http://www.food.gov.uk/foodlabelling/). Some labels include information on the amount that food contributes as percentages towards GDA (Guideline Daily Amounts) – to enable fair testing we have concentrated on vales per 100g.

Why do all cereals show information per 100g?

How could the manufacturers use the serving size to disguise how healthy the food is?

This cereal contains 8.1g of fat per 100g – is there another way we could say that? (8.1%)

# What's in your bowl?

## Objectives

Children should learn

- how the new food labelling system works;
- to read inequalities (recap);
- what a reasonable quantity of salt, sugar and fibre is in a food

## Slide 9 & 10

The first slide, titled "What's in your bowl?", features the Food Standards Agency logo and a "Traffic Light System" diagram. It shows three categories: Salt per 100g (green for <math>< 1/4\text{g}</math>, red for >math>> 1 1/4\text{g}</math>), Sugar per 100g (green for <math>< 2\text{g}</math>, red for >math>> 10\text{g}</math>), and Fibre per 100g (red for <math>< 3\text{g}</math>, green for >math>> 6\text{g}</math>). The second slide, titled "Using the Traffic Light System", asks questions like "Would it help people to make healthy choices?" and "Is there really that much difference between cereals?", and shows images of Ready Brek cereal boxes.

The Food Standards Agency (FSA) has proposed a front of pack nutrition labelling system which uses red, amber and green to indicate levels of fat, saturated fat, sugar and salt.

However, the scheme is voluntary and only a few supermarkets and manufacturers have said they'll use it; some have already said they won't.

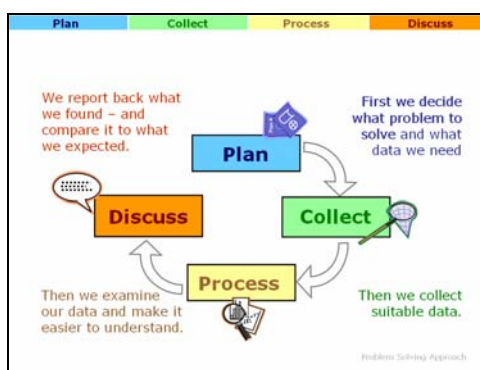
Some very interesting research has been carried out by the Consumers Association (Which?) and can be found at [www.which.co.uk](http://www.which.co.uk) (search on "Traffic Light" or "Breakfast Cereals").

Points to note - we have concentrated on three components Salt, Sugar and Fibre and the colour scale for Fibre is reversed. Salt content is sometimes recorded as just "sodium"

$$\text{Mass of salt per 100g} = 2.5 \times \text{sodium per 100g}$$

Pupils can practice using this system of labelling food in the first activity on the worksheet.

## Slide 11



This introduces the Problem Solving Approach that will be used during this investigation. The slide is repeated several times during the investigation to show the progress being made.

# What's in your bowl?

## Objectives

Children should learn that problems can often be solved in a variety of ways.

- that collecting and processing data needs to be carried out in a fair and effective way;
- to ask questions about presented information.

## Slide 12

Slide 12 is a presentation slide titled "What's in your bowl?". It features a progress bar at the top with four stages: Plan (blue), Collect (green), Process (yellow), and Discuss (orange). The "Plan" stage is active. The main heading is "What's in your bowl?". Below it, the question "Which cereals do you want to investigate?" is posed. Two options are presented: "A particular type of cereal" with a "Select" button and an image of a bowl of cereal labeled "e.g. rice-based"; and "The most popular cereals" with a "Select" button and an image of a box of Golden Crispies.

This part of the presentation gives two possible investigations – looking at particular types of cereal or concentrating on the most popular cereals for the class. If the former choice is made then we suggest dividing the class into groups and assigning each to look at different types of cereal. Once completed they could compare and contrast results with other groups to see if, for example, "Rice cereals tend to be rated worse than Wheat".

The latter choice allows pupils to collect two sets of data – a survey of their tastes and then the actual data from particular packages – and also involves more of their own data.

## Slide 13 OR 14

Slide 13 is a presentation slide titled "What's in your bowl?". It features a progress bar at the top with four stages: Plan (blue), Collect (green), Process (yellow), and Discuss (orange). The "Plan" stage is active. The main heading is "What's in your bowl?". Below it, the text "Oats, Wheat, Corn or Rice" is displayed. The question "Which **type** of cereal will you investigate (Oats, Wheat, Corn, or Rice)?" is posed. Below this, the question "What is the average content of salt, fibre and sugar for this cereal type (across all brands)?" is asked. Two more questions are posed: "Is there a brand which is all red?" and "Is there a brand which is all green?". Each question is accompanied by three circular icons representing different cereal brands. A "Next" link is located at the bottom right.

OR

Slide 14 is a presentation slide titled "What's in your bowl?". It features a progress bar at the top with four stages: Plan (blue), Collect (green), Process (yellow), and Discuss (orange). The "Plan" stage is active. The main heading is "What's in your bowl?". Below it, the text "Favourite cereals" is displayed. The question "Which cereals are **most popular** with children? Why?" is posed. Below this, the question "What is the average content of salt, fibre and sugar for these cereals? What is the range of contents?" is asked. The final question is "What traffic lights labels would you give the most popular cereals?". Below the question, there are three sets of traffic light icons (red, yellow, green) representing different cereal brands.

## 13 Investigating By Type

The slide presents some key questions (you could change these questions to suit your class). For a given 'type' such as Rice, the range of variations can be quite large; pupils could choose to look at just plain Rice Crispies but from as many manufacturers and supermarket brands as possible. Alternatively they could look at all Kellogg's versions of corn (Corn Flakes, Crunchy Nut, Frosties etc). When ready to move on, please use the 'next' link at the bottom of the slide – otherwise the slideshow will move on to "Investigating By Popularity"

## 14 Investigating By Popularity

The slide presents some questions to help initiate discussion of what we want to find out. You could change these questions to suit your class – this pathway is more directed than the alternative above.

# What's in your bowl?

## Objectives

Children should learn:

- to plan what data they will need to address their question;
- to think about where they can get relevant data from;
- that sometimes it is sensible to collect additional information that may help later;
- how their current task fits within the whole 'problem solving approach'.

## Slide 15

**Plan** **Collect** Process Discuss

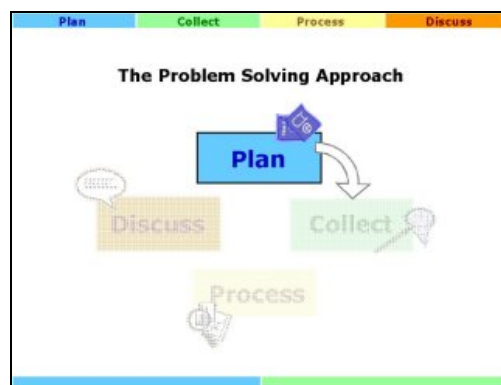
**What's in your bowl?**

What data should we collect?

How big a sample should we take?

Now that we have selected an investigation we must decide what data to collect.

## Slide 16



This slide shows which stage in the Problem Solving Approach we have reached having specified our key questions:

- What are the average salt/sugar/fibre contents of particular cereal types?
- OR What are the salt/sugar/fibre contents of the most popular cereals?

## Slide 17

**Plan** **Collect** Process Discuss

**Data Collection**

Cereal	Type Oats/Rice Corn/Puffed	Sugars (g) Per 100g	Salt (g) Per 100g	Fibre (g) Per 100g

Now it is time to collect some data – this could involve a survey of the classroom or homework to look in a local shop or their own kitchen cupboards. Some information can be obtained online via manufacturer websites Eg [www.weetabix.co.uk](http://www.weetabix.co.uk), [www.kelloggs.co.uk](http://www.kelloggs.co.uk), [www.nestle.co.uk](http://www.nestle.co.uk) etc



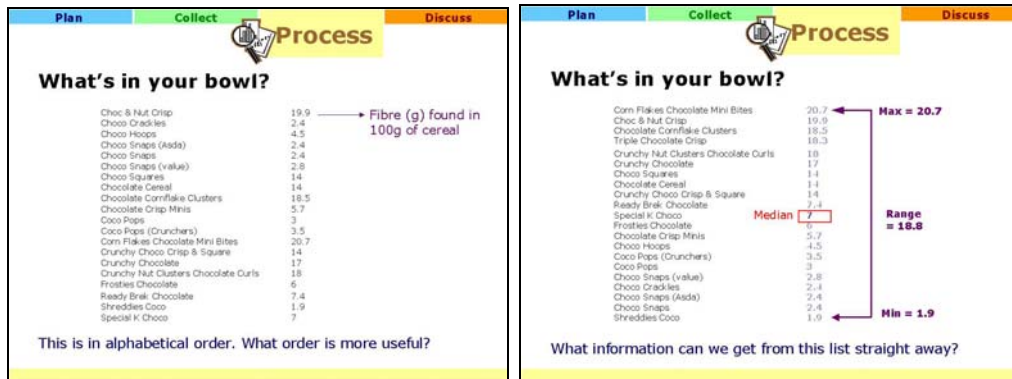
# What's in your bowl?

## Objectives

Children should learn:

- appropriate methods for displaying data;

## Slides 20 & 21



This slide shows raw data on fibre content in cereals. At first this listed alphabetically and pupils are asked a more suitable way to order the data – either ascending or descending order.

This could be a useful opportunity to show the various functions of spreadsheets – their ability to rapidly sort data, the Max and Min functions etc.

Since we have ranked the data this quickly allows the **median** to be calculated. The **mean** (9.7 to 1dp) could be also calculated by the class as with the **mode** (2.4 and 14) too.

## Slide 22



Here we have applied the traffic light system for Fibre (0-3g, 3-6g and 6g+) which shows that

- approximately half should be labelled green;
- one quarter orange;
- one quarter red.

Discussion is then suggested on how well this sample of materials scores. By revealing the pie chart and bar chart the greater proportion of the sample scoring 'green' for fibre is made very obvious. This should help emphasise the usefulness of graphs/charts in helping to show our results clearly and quickly.

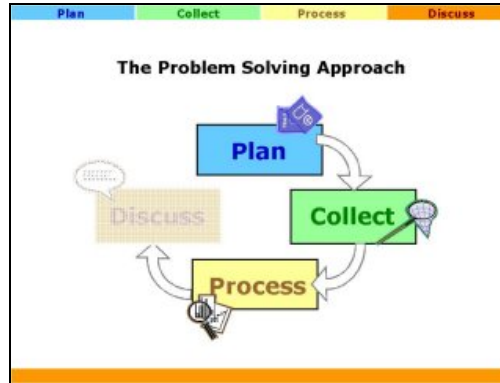
# What's in your bowl?

## Objectives

Children should learn:

- to relate their investigation back to the original problem;
- that investigating a problem often leads to new questions being asked.
- how the current task fits within the whole 'problem solving approach'.

## Slide 23



This slide shows which stage in the Problem Solving Approach we have reached having processed some data – we are now ready to discuss what we have found from the data.

## Slide 24

The slide is titled 'What's in your bowl?' and is in the 'Discuss' stage. It asks 'Which cereals did you investigate?' and offers two choices, each with a 'Select' button. The first choice is 'A particular type of cereal' with an image of a bowl of cereal and the text 'e.g. rice-based'. The second choice is 'The most popular cereals' with an image of a box of Frodo's Graham's cereal.

This slide reminds us of the choice we made earlier. Please click on the appropriate button.

## Slide 25 OR 26

Slide 25 is titled 'What's in your bowl?' and is in the 'Discuss' stage. It asks: 'Oats, Wheat, Corn or Rice?' and 'Which **type** of cereal did you investigate (Oats, Wheat, Corn, or Rice)?'. It then asks: 'What was the average content of salt, fibre and sugar for this cereal type (across all brands)?', 'How many brands were all red?' (with three red icons), 'How many brands were all green?' (with three green icons), and 'What was the most common set of colours?'. A 'Next' button is at the bottom right.

OR

Slide 26 is titled 'What's in your bowl?' and is in the 'Discuss' stage. It asks: 'Favourite cereals', 'Which cereals are **most popular** with children? Why?', 'What is the content of salt, fibre and sugar for the most popular cereals?', 'What traffic lights labels would you give the most popular cereal?', and 'Which is the 'healthiest' of the popular choices?'. At the bottom, there are three sets of traffic light icons: a green one, a red one, and an orange one.

This slide is used to remind us of the initial questions asked during the planning stage:

What are the average salt/sugar/fibre contents of particular cereal types?

OR What are the salt/sugar/fibre contents of the most popular cereals?

These can be edited or other questions could be added.

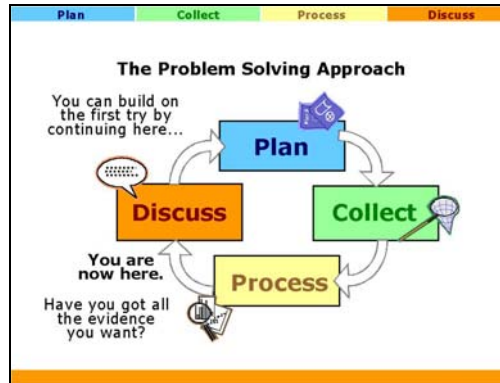
# What's in your bowl?

## Objectives

Children should learn:

- how the current task fits within the whole 'problem solving approach';
- to review their prior work.

## Slide 27



This is the final screen, from a series of similar screens, showing which stage in the Problem Solving Approach we have reached.

Having discussed our findings we could now start the whole cycle again.

Possible continuations could be

- to follow the alternative investigations made during the earlier choice screens;
- to extend the survey of breakfast cereals to take in more classes or different ages;
- to look at other meals, snack foods, fast foods etc;

## Slide 28

