**An investigation**: **McDonalds Food**

**Step 1 Understanding the context**

The data comes from the McDonalds website: <http://mcdonalds.co.nz/our-food/nutrition>

Several years ago McDonalds received a lot of media attention about the nutritional value (or otherwise) of its foods. McDonalds responded by diversifying the range of food on its menu.

<http://en.wikipedia.org/wiki/Super_Size_Me>

<http://www.metacafe.com/watch/1029858/mcdonalds_food_the_truth/>

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Product** | **Energy (kJ) /100g food** | **Protein (g) /100g food** | **Fat, total (g) /100g food** | **Carbohydrate total (g) /100g food** | **Sodium (mg)**  **/100g food** |

Explain what is meant by the following terms: (in the context of McDonalds or food in general)

product

energy

protein

fat

carbohydrate

sodium

Why is each variable recorded as ‘/100g food’?

Homework:

Research questions

What are common fat, protein, carbohydrate foods?

What does our body need fat, protein, carbohydrate and sodium for?

Why is sodium added to food?

Write down other questions you need to find answers to about these food types.

Where did you find the information? Reference your source- preferably provide a printout.

**Step 2 Deciding on an investigation and writing a question/purpose statement:**

For the following questions decide:

Which are sensible pairs to investigate and which are not.

Which variable would go on which axis and why.

Write your answers on the sheet.

Is there a relationship between the amount of salt per 100g food and the amount of fat contained in McDonalds foods?

What is the nature of the relationship between the amount of fat and amount of carbohydrate per 100g food for McDonald’s food?

Can the amount of carbohydrate per 100g food be used to predict the amount of energy in the food for McDonalds products?

How does the amount of protein per 100g food relate to the amount of sodium in McDonalds foods?

Is there a relationship between the amount of fat and the amount of protein per 100g food for McDonalds products?

What is the nature of the relationship between the amount of energy and the amount of sodium in 100g food for McDonalds products?

Can the amount of fat be used to determine the amount of energy contained in 100g food for McDonalds foods?

For McDonalds foods, how does the amount of protein per 100g of food affect the amount of energy contained in the food?

Is there a relationship between the amount of protein and the amount of carbohydrate in every 100g of food for McDonalds products?

Can I use the amount of carbohydrate per 100g food to predict the amount of sodium in McDonalds foods?

In the computer room: Use the McDonalds data set.

Do several quick graphs to see which variables do show relationships.

Write down 2 pairs that you think sensible to choose.

For the purposes of this worked example we are all going to proceed with:

(the purpose of the investigation)

the variables you are looking at and the units they are measured in:

Explanatory variable:

Response variable:

Why are you putting the variables on the axes in that order?

What you know about the source of the data:-

How will you go about your investigation?

**Step 3 The Graph**

*Produce a scatterplot for energy content (response) vs fat content (explanatory)*

*Print the graph. Draw by hand a band on each graph that encloses most of the data.*

* **Write a description of the scattergraph (TASgu)**

For the graph of ….

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What relationship is shown in this scatter plot? [State the relationship in context]

**Step 4 Obtaining a model and making a prediction.**

*Write down the equation of the regression line:*

*Explain what the regression line tells you about the relationship between the variables.*

*Explain what the gradient of the regression line tells you.*

*Obtain the regression coefficient, r = …..*

*Explain what r tells you.*

*Use your regression equation to make a prediction.* *[think about why you would make this particular prediction]*

*Discuss how precise your prediction is. Give an interval in which you think it is highly likely for a value to be within for your stated x-value.*

**Step 5. Investigating groups or outliers**

*Think about the data. Look at the graphs. Is there any evidence of groups or outliers? If so, redo an analysis to better explain the relationship between the variables. [This is where you really show your independent thinking]*

*Print out any new graphs.*

*Describe what these new graphs tell you about the relationship between the variables. Explain why you did this further analysis. Compare these findings with your previous work.*

**Step 6. Discussion**

*Discuss any of the following that are relevant to this investigation:*

*-any assumptions you made in the analysis*

*-limitations of the model*

*-potential sources of bias*

*-the relevance and usefulness of your findings – how widely the findings could be applied.*