Can we eat what we like?

create maths

If we...	What is going to happen?
...eat more than our bodies can use	
...eat lots of sugary foods	
...eat lots of salt	

food and drink

How much ***sugar***, ***salt*** and ***fat*** do these foods contain?

Arrange the items in order of how much fat, how much sugar, and how much salt they have.

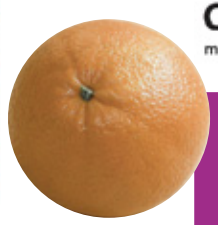
Ready salted crisps


Plain naan bread

Can of cola


Pepperoni pizza

Baked beans


Orange

create maths

food and drink

Put the foods in order		
Sugar	***Salt***	***Fat***

Answer		
Sugar	***Salt***	***Fat***
Item Amount g	Item Amount g	Item Amount g

Your **maximum daily amount** of fat, sugar and salt

Sugar (g)	***Salt (g)***	***Fat (g)***

How many of each item can ***you*** have before you reach the **maximum daily amounts** for fat, sugar or salt?

Dieticians calculate how many calories we need

The key variables which determine daily energy requirements are:

Age, sex, height, weight and level of physical activity

These differ from person to person.

Person:

You are going to **calculate** the **energy requirements** for either yourself or for a family member or friend.

Age yrs	Height cm	Weight kg

Estimated average requirement = Basal Metabolic Rate (BMR) x Physical Activity Level (PAL)

Use the **Energy requirements fact card** to calculate basic metabolic rate and physical activity level.

BMR		PAL		Energy kcal
	x		=	

Compare your estimate to the **recommended value**.

Recommended daily energy requirement (kcal)

Age	*Boys*	*Girls*
11-14	2,220	1,845
15-18	2,775	2,110
Adults	2,550	1,940

Source: British Nutrition Foundation

food and drink

You are what **you eat!**

- You are to take on the role of a **nutritionist**.
- Your job is to first assess the **energy requirements** of two clients of your choice.
- Research and plan a lunchtime meal for each client that is suitable for them **based on their lifestyles**.
- You will probably want to **include a drink**, something savoury and perhaps something sweet.

A lunchtime meal should provide between 25% to 33% of the daily energy required.

The **Fat, Salt, Sugar** and **Energy requirements** fact cards will help.

For each client **write a report** on the meal you recommend including a ***breakdown of the nutrients***.

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food and drink

Sugar Most people in the UK eat too much sugar

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food and drink

Age	Maximum daily amount of sugar
5 to 10	85g
11 and over (female)	90g
11 and over (male)	120g

Source: Food and Drink Federation

Carbohydrates are the main provider of **energy** in our diets.
There are two types, **sugars and starches**.
A main concern is not to exceed the daily recommended amount of sugar. This is often reported on food labels as **Carbohydrate (of which sugars)**

Salt 85% of men and 69% of women eat too much salt

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food and drink

Age	Maximum daily amount of salt
1 to 3 years	2g
4 to 6 years	3g
7 to 10 years	5g
11 years and over	6g

Source: Food Standards Agency

Often **sodium** is reported on food labels instead of **salt**.
To obtain the salt level **multiply the sodium level by 2.5**.

Basal metabolic rate (BMR)

The basal metabolic rate **(BMR)** is an estimate of the *amount of energy* required by our bodies when lying still, relaxed and warm.

BMR for boys = 66 + (13.7 x weight in kg) + (5 x height in cm) − (6.8 x age in years)

BMR for girls = 655 + (9.6 x weight in kg) + (1.8 x height in cm) − (4.7 x age in years)

Physical activity level (PAL)

The multiplier, Physical Activity Level, indicates how active we are.

How active are you?	Physical activity level
Little or no exercise	**1.200**
Slightly active (light exercise/sport 1-3 days / week)	**1.375**
Moderately active (moderate exercise / sport 3-5 days per week)	**1.550**
Very active (hard exercise / sports 6-7 days per week)	**1.725**
Extra active (very hard exercise / sports)	**1.900**

food and drink

Fat The good and the bad

No more than **33%** of your daily total energy should be provided by fats

1 gram of fat provides **9 kcal** of energy

Fat provides **essential fatty acids**.
It is needed for health but only in small amounts. There are **good fats** and bad fats. **Bad fats are saturated fats** and trans fats.

Calories

Source: British Nutrition Foundation

Recommended daily energy requirements (kcal)		
Age	*Boys*	*Girls*
11 – 14	*2,220*	*1,845*
15 – 18	*2,775*	*2,110*
Adults	*2,550*	*1,940*

food and drink

Teacher notes

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Food and drink: Minimise or SuperSize

Description

How many of us are aware of the calories, sugar, salt and fat contain in the food we eat? How many of us use the information provided on food labels as best we can? In this topic, pupils critically compare nutritional measures and calculate their daily energy requirements.

Starter activity: Can we eat what we like?

Activity 1: Sugar, salt and fat

Activity 2: Calculating energy requirements

Activity 3: Working as a nutritionist

Can we eat what we like? is a starter activity. Pupils can take a few minutes to fill in the worksheet individually to prompt a whole class discussion about the consequences of a bad diet.

If we …	What is going to happen
Eat more than our bodies can use	Get fat
Eat lots of sugary foods	Tooth decay Diabetes High blood cholesterol
Eat lots of salt	High blood pressure Poorly heart

Guidelines related to how much food we should eat to get the required amount of energy are provided on many food labels but how accurate are they for everybody? In **Calculating Energy Requirements**, pupils use a scientific formula and the **Energy requirements fact card** to estimate energy requirements and compare these to the guidelines for themselves or someone they know.

Resources

As background for this topic, a variety of web-pages will be useful:

www.eatwell.gov.uk	Food Standards Agency site on eating well
www.food.gov.uk	Food Standards Agency
www.nhsdirect.nhs.uk	NHS direct
www.nutrition.org.uk	British Nutrition Foundation
www.dh.gov.uk	Department of health

People are likely to use different levels of energy as they are different heights, weights and do different levels of physical activity. Their nutritional requirements are therefore also likely to be different which indicates we should all pay special attention to our own diets and lifestyles. **Sugar, salt and fat** explores the pupils' perception of the amounts in a selection of everyday foods and compares this with reasonable estimates.

Sugar		Salt		Fat	
Item	Amount	Item	Amount	Item	Amount
Coke	35g	Pizza	6g	Pizza	34g
Beans	21g	Beans	3.4g	Crisps	11.7g
Orange	14g	Naan	1.2g	Naan	5.1g
Pizza	8g	Crisps	0.5g	Beans	0.8g
Naan	6.6g	Coke	<0.1g	Coke	0g
Crisps	0.2g	Orange	0g	Orange	0g

NB: Different brands of product are likely to have different levels of fat, sugar and salt to those shown.

They calculate their own recommended maximum daily amounts (RDA) using these results and the **Sugar, Salt** and **Fat fact cards**. Some pupils may need help with the two stage thinking required to calculate the recommended fat intake. Finally, some fun can be had with questions on RDA like *How big an orange could you eat?*

Food and drink: Minimise or SuperSize

Are the BMR formulae correct?

The BMR formulae use a constant value of 66 for boys yet a constant value of 655 for girls. Is this an error? On closer examination you will notice that the multipliers for weight, height and age are larger for boys than for boys. Scientific studies have shown that changes in weight, height and age have a greater effect on the BMR for boys than for girls.

Many people are aware of the measure, Body Mass Index (BMI), to assess their weight. NHS direct advise that, since children grow rapidly and boys and girls grow at different rates, BMI charts for children are based on both age and gender. Pupils could interpret their BMI value using the BMI calculator for children, found at the Centre for Disease Control and Prevention website.
(http://apps.nccd.cdc.gov/dnpabmi/Calculator.aspx)

Working as a Nutritionist requires the pupils to take on the role of a nutritionist and plan suitable lunchtime meals for either a family member, a celebrity, a sports person or maybe a willing teacher. It can be led by discussion and allows opportunity for a good selection of display work.

Examples of the kind of profile required:

Erin

I am 13 years old and love sports and gymnastics. I do lots of exercise and often feel very tired. I am very careful about what I eat, but somehow my body needs more fuel so I don't fall asleep in class.

I am 163cm tall and weigh 51kg.

Please help me find a healthy, energy packed meal.

Zach

I am 14 years old and love fast food and watching sport on TV. My mum tells me I am grumpy and have not gone out on my bike since I was given a new computer game for my birthday. To be honest I am a little worried as I can no longer fit into my favourite jeans.

I am 173cm tall and weigh 72kg

My sporty uncle did some calculations and estimated I am having around 2800 calories per day. This means nothing to me as I have no idea how many calories I should be eating.

Please help me.

The pupils will first assess the energy requirements of two clients using the **Energy requirements fact card** then make use of a variety of websites to find suitable lunchtime meals. Ideas for healthy lunches can be found at:

http://www.eatwell.gov.uk/agesandstages/children/
and the nutrition content of many foods including fruit and vegetables can be found at *www.nutritiondata.com*
Many fast food outlets have their own websites which provide nutritional information about their products.

Encourage the pupils to use tables, graphs and pictures to represent the information as clearly as possible.

The mathematics

The pupils will calculate proportions and percentages, work with measures, use formulae, organise and process information and work with data handling representations.