**Lesson plans on sugar & fibre**

It makes most sense to each about the impact of sugar on health in the context of fibre. This is especially the case if trying to teach about food & mood and the importance of eating regularly, and why eating too many highly processed foods might not be the best thing to do. There are also easy links to make with lesson plan ideas in the ***“Marketing and Sponsorship resources” folder***

**Sugar lesson plan**

**Learning Outcomes:**

* To be more aware of the efforts made to promote sugary soft drinks
* To understand the effect of sugar on health
* To understand the effect of caffeine
* To know how much sugar and caffeine is in soft drinks

**Key Vocabulary:** Energy drinks, caffeine, sports drinks, additives, side-effects

* Ask pupils to read and summarize the “***Sugar information Fact Sheet***” from the British Dietetic Association (written by me!)
* Name three ways in which a high sugar diet might be harmful to health. Did you find anything in the Fact Sheet surprising?
* Ask pupils to have a look at the CSPI “***Facts on Sugar Drink Marketing***”. What do they think about this?
* Have a look at [www.opentruthnow.org](http://www.opentruthnow.org) to find out more about the impact of sugar on health, how sugary drinks are marketed and what can be done about it. You can ask groups of pupils to click on a circle each and feedback to the class what the learnt about the impact on health.

The site includes some hard hitting pieces of poetry about sugary drinks – click on the links below or access via the above website (I recommend you watch them first without the pupils as they are quite hard hitting). They are about 5 minutes each.

<https://www.youtube.com/watch?v=yuhhxTj5od0&feature=player_embedded>

[https://www.youtube.com/watch?v=**tgh8NxNnhoI**&**feature**=player\_embedded](https://www.youtube.com/watch?v=tgh8NxNnhoI&feature=player_embedded)

* Take a look at the following link to a 1 minute video about how much sugar we eat. It also introduces the “Sugar Smart App”: <http://youtu.be/Mcw8GBxeF1o>
* Do you know how much added sugar is in the food and drink you buy? Take a look at the following 3 minute video with Jamelia demonstrating the “Sugar Smart App”. This allows you to scan bar codes for teaspoons of sugar: <https://www.youtube.com/watch?feature=player_embedded&v=9ayqCcDKl50>

If you want to download the app or find out more about added sugar, visit: [www.nhs.uk/change4life](http://www.nhs.uk/change4life)

* You could do a survey of soft drink consumption. What brands do people see advertised and what forms of advertising? Which, if any, of these brands do you drink? How much and how often? Next time they are in the shop that sells them, they could test out the “Sugar Smart App”. What role might marketing have played in their choice?
* The World Health Organisation has suggested that our **total added sugar** intake is no more than 5 % of our daily calorie intake.For most of us this is about 25 to 30g or **6 or 7 teaspoons a day** and about **a third of the intake of the average Scottish teenager.** **Many fizzy drinks contain 12 teaspoons** (50g) in just one 500ml bottle! That’s double the maximum level in 1 serving!
* What else goes into a sugary drink? Colourings? Preservatives? **Caffeine?** Chemical Sweeteners like Aspartame? How healthy do you think these are?
* Younger High school pupils should avoid more than 100mg per day of caffeine. 200mg per day is the daily limit in pregnancy as too much harms the unborn child.
* See ***Supp res 8: Caffeine & sugar levels in drinks*** and **estimate how much caffeine and sugar you are drinking.** Remember that added sugar is in many foods not just drinks!
* Do any of the pupils think they have **more than 100mg of caffeine a day?** Do they drink any of this **after school** or in the evening? Avoid caffeine after school as it can delay sleep.
* Pupils can also **search for “*Side-effects of caffeine*”**. Pupils who consume caffeine in soft drinks report more **headaches** and **stomach aches** than those who do not. Do they have **difficulty sleeping**? Caffeine can also make you feel, shaky and **sweaty** if you have too much. It is also **addictive**. Some people believe that this is why it is added to sugary drinks. Use the “***2 energy drinks slides supporting resource 4”.*** For background reading (as a teacher) see “***Caffeine in Energy Drinks sup res 2”***
* Canada has set guidance on safe caffeine limits in adolescents. This is 85mg per day for 10 to 12 year olds and about 100 to200mg per day for teenagers and adults (depending on age and weight). 100mg of caffeine is provided by 300mls of an “Energy drink” (as well as lots of sugar), 1 cup of coffee or 2 cups of tea. There are smaller amounts of caffeine in chocolate, Irn Bru and Colas but these contain lots of sugar and few nutrients.
* How does the sugar content of **sports drinks** compare with energy drinks and standard fizzy drinks? Do you need them if you are not doing sport? Do you need them for sport?
* The Scottish government have banned drinks containing added sugar from Scottish schools. Do your pupils think that they were right to do this? Is there a good choice of drinks in your school canteen?
* You can buy **pure fruit juice and smoothies** in the canteen. What does the BDA Sugar Fact Sheet say about fruit juice and smoothies? Are these any better?
* Ask the pupils what else they think the government should do: Should they make them less sweet, put them in smaller bottles or maybe put the price up so that we are less likely to have so much? Or do the pupils think that it should be our choice? What about a tax on sugary drinks?
* What do you think is the healthiest drink?

**Extra guidance on Soft Drinks and Energy Drinks:** The following links take you to sites that are campaigning to reduce the marketing and availability of sugary soft drinks:

[www.Actiononsugar.org](http://www.Actiononsugar.org); (UK site)

[www.sugardrinksfacts.org](http://www.sugardrinksfacts.org)(American site)

You’ll also find a copy of a soft drinks guide I’ve developed for parents. There is also a briefing paper on energy drinks for teachers and other professionals. These are included mostly as background information for you. Feel free to use the information in any lesson planning.

**Cross curricular opportunity**: The above lesson plan ideas link in well with Home Economics and Science. In addition, the most obvious cross curricular link is with English, given how the media can be used to change the way we think. There is also an opportunity to link this lesson to further learning about Scottish food history food and the increased availability of sugar produced by slaves. Sugar consumption in Britain was 22 times higher in 1900 than in 1700! What did this do for our health? Social subjects could be used to explore fair trade accreditation for sugar. There is also the potential for quite a bit of data handling in this lesson (per serving / per 100ml etc) so there are potential links to Maths.

**Sources and Benefits of Fibre**

This is a basic lesson plan about fibre and may have already been partly covered in Home Economics. It is an important foundation to have before looking at the overall balance of sugar and fibre which is covered in ***“Nutrition labelling contrasting sugar and fibre & the importance of breakfast”***

**Learning Outcomes:**

* To understand what fibre is
* To understand the effect of fibre on health and mood
* To appreciate that many processed foods have had the fibre removed
* To be able to name the main sources of fibre

**Key Vocabulary:**

 Fibre, NSP, plant cell walls, food processing, wholegrain,

**Key messages:**

* Fibre is crushed plant cell walls.
* The scientific term is NSP (Non-starch polysaccharides). (Used in Health & Food Technology)
* We need fibre for a healthy digestive system.
* Fibre also makes us feel fuller for longer, and helps keep our blood sugar at the right level (not too high, not too low)
* Sometimes, food processing removes fibre (eg: the removal of the husk from wheat grans to make white flour, and the squeezing of fruit to make juice).
* Ask pupils to pick out good sources of fibre from the “Eatwell plate”. (These can be found in three of the 5 food groups if the right foods are chosen. Good sources of fibre are beans, nuts, lentils, fruit, vegetables, oats, wholemeal bread and cereals made with oats or wholewheat).
* The traditional Scottish Diet (late 18th century) had a lot of fibre from oats, barley, peas and beans.

Check out the Fife Diet manifesto which includes all school leavers in Scotland being able to make soup! (This might be a good “cooking bus” activity?).

**Cross Curricular Opportunity:** Once again there are potential links to Scottish food history and role of oatmeal and barley in the Scottish diet (Bere bannocks, oatcakes, porridge, Scotch Broth etc) & replacement with white bread and sugar in the 19th century).

Further learning opportunities about traditional Scottish high fibre cereal based foods could come from joint working with Crofting Connections. ([www.crofting.connections.com](http://www.crofting.connections.com))

**Nutrition labelling contrasting sugar and fibre, the importance of breakfast, & the effect of food processing**

**Learning Outcomes:**

* To know how to interpret nutrition labels
* To be able to evaluate breakfast cereals
* To understand how sugar and fibre affect blood sugar differently
* To know what levels of fibre or sugar count as high or low
* To understand how food processing can make food less healthy

If pupils have not done them already, you can use the two “**P6/7 “*Breakfast cereals***” lesson plans. The “Back of pack – Nutrition labelling lesson is probably better for High school than the “Front of Pack” one. The latter may be too young for High school.

Key messages on sugar & fibre in breakfast cereals include:

* Eat breakfast! High fibre foods like beans, porridge, wholemeal toast and fruit are best.
* We need more fibre in our diet for healthy digestion and to control the sugar in our blood (from fibre lesson)
* A high sugar diet is bad for our teeth, our liver, our heart and our general health (from sugar lesson)
* Most people in Scotland have too much added sugar.
* When we do consume sugar, our body handles it better if we have fibre at the same time.
* 6g or more per 100g is a high fibre food.
* 22.5g per 100g or more is a high sugar food.
* 6g per 100mls or more is a high sugar drink.
* The sugar and fibre contents are shown on the ingredients list of most foods & drinks labels.

Use the **“*sugar\_fibre\_mood sup res 5*” *powerpoint*** give a stronger visual understanding of the relationship between mood, blood glucose, and sugar & fibre in the diet. (These 2 slides are also shown in the ***“Varied regular eating” powerpoint*** in the nutrition foundation folder so they may have seen these already but show them again as a refresher now that they’ve covered sugar and fibre in more detail).

Ask the pupils what would happen to blood glucose if no breakfast is eaten. How about a low fibre, high sugar breakfast? What would happen if a pupil skipped lunch?

For high sugar foods, try dividing the percentage sugar by the percentage fibre. **If this ratio is over 4, it is not the best choice in terms of nutrition!**

Try this calculation for breakfast cereals, cereal bars and biscuits. Pupils will be able to conclude that:

* There are more healthy cereals than cereal bars or biscuits
* Some cereals are better than others!

(Also, cereal tends to be consumed with milk, cereal bars are usually not).

On ***sup res 5***, you’ll also see various pictures of foods in unprocessed & processed form, to stimulate discuss about how often food processing makes food less healthy. Note that the top example is coca leaves (mild stimulant) compared to purified cocaine (very dangerous) as an analogy. Feel free to remove this if you feel its not right for your pupils, but it might be helpful if you are already covering drug awareness with the same pupils in PSE for example.

Have a look at the following video and ask pupils to critique it.

<https://www.youtube.com/watch?v=UPmZx9nhTOI&feature=player_detailpage>

What impression are they trying to give about chocolate digestives? How does that compare to the actual nutrition they provide? (The sugar to fibre ratio for chocolate digestives is about 10 to 1!)

**Cross Curricular Opportunity:** This work on ratios of sugar to fibre, provides a natural link to Maths