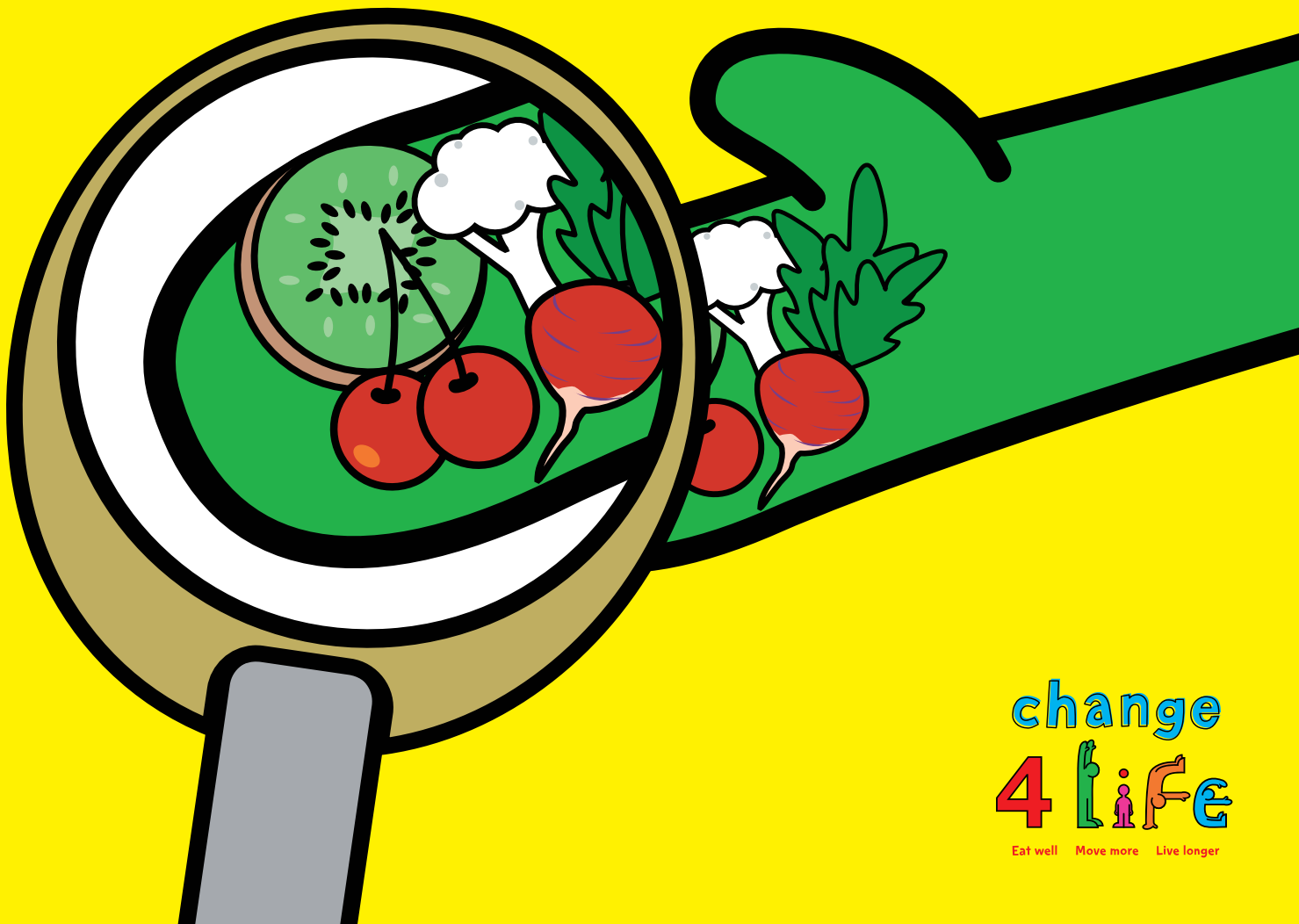


**food**  
detectives  
key stage 2

# Lesson plan

Supporting the design and technology, science, mathematics, computing and English curricula



# food detectives

## key stage 2



## Lesson plan

In these activities, pupils become food detectives and find out all about the sugar in food. They identify fruit and vegetables as a great alternative to foods with added sugar, and carry out a hands-on investigation of different types of fruit and vegetables. They then use this research as a foundation for making more active and informed food and drink choices within school and at home.

### Learning objectives

By the end of these activities, pupils will be able to:

- explain why too much added sugar in foods is bad for you
- recall the new recommended daily maximum sugar intake for their age range
- identify how much sugar is contained in food and drink products by looking at labels
- calculate sugar amounts based on quantities and serving sizes
- compare the sugar content in a variety of food and drink products
- explain 5 a Day and why fruit and vegetables are an important part of a healthy diet
- investigate the properties of fruit and vegetables, describing their appearance, smell, taste and texture
- select healthy alternatives to sugary foods, including fruit and vegetables

### Resources

In addition to the resources in this pack, to complete the activities you will need:

- to ask pupils to bring in empty packets of food they eat at home (e.g. breakfast cereals, drinks, yoghurts, biscuits, chocolate and other snacks)
- sugar cubes (4g each)
- plates with samples of eight different fruits and vegetables for each pupil to taste (preferably four fruits and four vegetables)
- a tablet or smartphone enabled with the Change4Life Sugar Smart app (ideally linking to an interactive whiteboard)
- a selection of single-serving drink products, including a can of cola or other fizzy pop, a bottle of plain water, fruit juice, juice drink, flavoured water, milk, flavoured milk, an energy drink and a sports drink. (It is recommended that you check that your chosen products are listed on the Change4Life Sugar Smart app prior to the lesson)
- squared graph paper for optional bar chart extension work

Please be allergy aware.

### Delivery and timings

These resources have been designed to be flexible – you can choose how to fit them into your timetable. In addition to the main lesson plan (made up of starter activities, a main activity and plenary), there is a homework resource and three optional activities for you to choose from. You may decide to spread the activities out across a week or more, deliver the bulk of them in a single afternoon, or develop different activities into mini-topics covering a number of lessons.

Suggested timings are given, but these are intended for guidance only.

## Key terms

- **calories (kcal)** are a way of measuring the amount of energy that a food contains. You normally see them on food labels, per 100g and per portion size
- **carbohydrates** are a major source of food energy for people throughout the world. **Sugars** and **starches** are the main forms of carbohydrate (and energy) in the diet of people in the UK. Carbohydrates are found in foods such as bread, pasta, rice, breakfast cereals, fruits, vegetables, milk and yoghurts
- **minerals** like calcium and iron in food help to build strong bones and teeth, deliver oxygen around our body, control body fluids inside and outside cells, and turn the food we eat into energy
- **vitamins** like vitamin C and the B vitamins are found in fruit and vegetables. Vitamins help our bodies to keep working properly
- **fibre** is only found in food that comes from plants. It can improve digestive health and may help prevent heart disease, diabetes, weight gain and some cancers

## STARTER ACTIVITY 1:

# Spying on Sugar

D&T

English

Science

Mathematics



SCHOOL ZONE

Search [Change4Life/schools](#) for accompanying PowerPoint presentation.

Ask the pupils to bring in empty packets of food they eat at home (e.g. breakfast cereal, fizzy drinks, biscuits, cakes, sweets, yoghurts, fruit juice, smoothies).

Before the activity, make a note of the amount of sugar each product contains per 100g. This is the **carbohydrates (of which sugars)** figure in the nutrition panel.

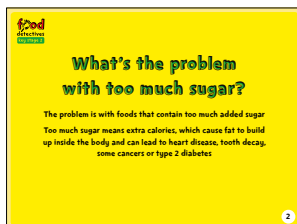
slide 1



Explain to the pupils that today they're going to become food detectives and find out all about sugar.

What foods contain sugar? How can we find out how much sugar they contain? And what can we eat instead of sugary snacks, puddings and drinks?

slide 2



Explain to the pupils that when too much sugar is added to food it can cause problems.

These foods are high in energy, which is measured in calories (kcal). Eating too much of them causes fat to build up inside your body and can make you overweight. And being overweight increases your risk of health problems such as heart disease, tooth decay, some cancers and type 2 diabetes.

slide 3



Divide the pupils into groups. Tell them that they need to use their powers of deduction to sort their food products in order of sugar content. Start with the least sugary on the left and end with the most sugary on the right. Make sure they don't cheat and look at the labels!

Ask each group in turn what they have decided and why. Encourage them to talk about why they have made decisions (e.g. how sweet a food tastes, how much energy it provides).

Once the pupils are happy with the way they have sorted the products, reveal what the correct order should be. Explain to them how they can find out the amount of sugar in the food by looking at the nutrition information on the label.

Are there any surprises? Ask the pupils if they think they might change some of their food choices as a result of what they have found out.

## STARTER ACTIVITY 2:

# Sugar Towers

D&T

English

Science

Mathematics

slide 4



Ask the pupils to recall their maximum daily sugar limit.

To help older pupils gain a real understanding of what different amounts of sugar look like, give each group a bowl of sugar cubes. Explain that a sugar cube weighs around 4g.

Can they work out how many sugar cubes there are in their products by dividing the amount of sugar listed on the label by 4?

Explain to the pupils how to round up or down as needed. Encourage pupils to compare how much sugar is contained per 100g of each product.

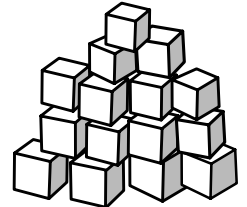
Ask the pupils to build a sugar cube tower alongside each product.

Is this more or less sugar than they expected?

You could extend these activities by setting pupils maths challenges based on sugar cube amounts, for example:

- if you had a can of fizzy drink and a slice of cake, how many sugar cubes would they be equivalent to?
- how much over your maximum recommended daily sugar limit would the fizzy drink and cake combination be?
- how many grams of sugar does this add up to? Can you write this in kilograms?

You could ask the pupils to add up how much sugar they ate and drank at the weekend. Children are eating three times more sugar than their maximum daily sugar limit – the biggest source is sugary drinks.



## MAIN ACTIVITY:

# Fruit and Veg Put to the Test

D&T

English

Science



Explain to the pupils that now they know just how much sugar there is in everyday foods, it's time for them to use their detective skills to find something healthier to eat instead.

Can they think of healthier alternatives to sugary foods? Hopefully it won't be long before someone suggests fruit and vegetables.

slide 5



Explain that fruit and vegetables are a great replacement for foods with added sugar because they are an important part of a healthy, balanced diet.

Ask the pupils if they have heard of 5 a Day. Explain that we all need at least five portions of a variety of fruit and vegetables every day to stay healthy. An example of a portion is one apple, one banana or three

heaped tablespoons of cooked vegetables. Fruit and vegetables are a healthier choice because they contain fibre, vitamins and minerals. Remind the pupils that fresh, frozen, tinned, juiced and dried fruit and vegetables all count towards your 5 a Day. They don't need to worry about the sugar in whole fruit as it isn't added sugar, so it's ok to swap from sugary puddings and snacks to fruit instead.

Tell the pupils that they're going to use their detective skills to investigate different fruit and vegetables and identify the properties of each. Like all good detectives, they're going to have to make the most of all their senses; in this case sight, smell, taste and touch.

Give each pupil small samples of eight different fruits and vegetables that you have prepared before the lesson (four of each). Why not include some dried and tinned fruit in the selection (e.g. raisins, tinned peaches)? Or try introducing the pupils to some more unusual options, such as fennel, beetroot, mango or lychee.

Tell the pupils to look but not touch! Do they recognise all of the fruits and vegetables? Have they eaten them before?

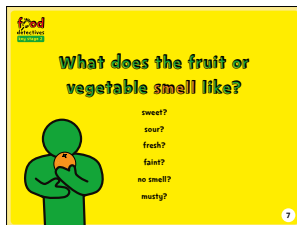
Ask the pupils to write the names of the fruits and vegetables in their notebooks, leaving space to write down descriptive words about each as they look, smell, taste and feel.

slide 6



Ask the pupils to take a good look at each type of fruit and vegetable. How would they describe its appearance? There are some ideas to help them on the screen.

slide 7



Then ask the pupils to pick up each piece of fruit and vegetable in turn and smell it. What words would they use to describe the smell? Again, there are some words to help them on the screen.

slides 8 and 9



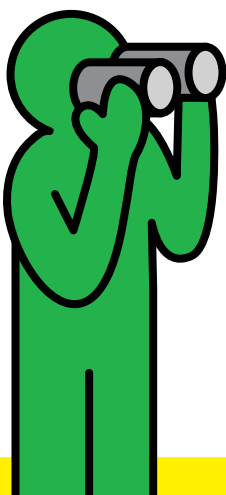
Ask the pupils to taste each piece of fruit and vegetable in turn. How would they describe its taste? What does it feel like when it's in their mouth?

Encourage them to write words in their notebook after they have tasted each sample, so they don't get the different tastes and textures mixed up.

slide 10



Finally, give each pupil a **Fruit and Veg Favourites** sheet. Ask them to choose their four favourite fruits or vegetables and write a profile of each, drawing a picture, filling in a description and giving a mark out of 10!



food detectives investigate

## Fruit and Veg Favourites!

**Fruit and Veg Favourites!**

Look: \_\_\_\_\_

Smell: \_\_\_\_\_

Feel: \_\_\_\_\_

Taste: \_\_\_\_\_

Mark it out of 10: \_\_\_\_\_

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**Fruit and Veg Favourites!**

Look: \_\_\_\_\_

Smell: \_\_\_\_\_

Feel: \_\_\_\_\_

Taste: \_\_\_\_\_

Mark it out of 10: \_\_\_\_\_

PHOTOCOPY ME



- D&T
- Science
- English

# Fruit and Veg Favourites

slide 11



As a class, talk about which fruits and vegetables the pupils have chosen as their favourites and why. Overall, what are their top three?

As the pupils have already discovered, eating more fruit and vegetables is a great way to cut the amount of sugar in their diet and to make sure they get their 5 a Day.

Ask the pupils for ideas about how they could incorporate more fruit and vegetables into their day.

Can they think of how they could swap sugary foods for healthier foods at breakfast-time? As an after-school snack? As a drink? As a pudding?

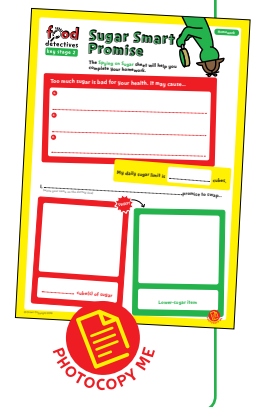
## Homework activity – Sugar Smart Promise

- D&T
- English
- Science

Give the pupils the **Spying on Sugar** fact sheet, explaining that the first part of their homework task is to share what they have discovered about sugar with their families, using the fact sheet as a prompt.

Present the **Sugar Smart Promise** poster. Tell the pupils that they are to create a poster that will increase awareness of why we need to cut down on sugar, make them aware of the sugar content in various products and encourage them to sugar swap to a healthier option, in the form of a promise. These posters may later be displayed in and around the classroom and school.

Why don't the pupils try to make sugar swapping a family commitment? Having identified an area of improvement in their diet, each family member can record a promised swap on the **Sugar Smart Family Promise** sheet.



## Smooth Algorithm

- D&T
- English
- Science
- Computing

Asking the pupils to write an algorithm for a simple recipe can be a great way to help them understand the importance of breaking programming instructions down into the smallest possible steps.

Explain to the pupils that for this activity you are going to be a smoothie bot and that they need to program you to make a smoothie. Give them the **Smooth Algorithm** sheet and, working in groups, ask them to write an algorithm for making the smoothie recipe provided. Encourage them to think like a detective and use logical reasoning. Emphasise the level of detail they're going to need to provide if their algorithm is going to work.

Get the ingredients and equipment ready and prepare for a messy outcome! When things go wrong, encourage the pupils to detect and correct their errors.



## 5 a Day Diary

- D&T
- English
- Science
- Mathematics

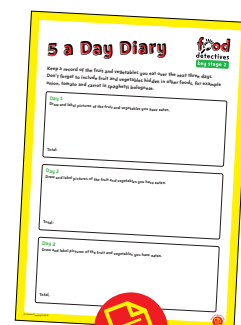
Use the **5 a Day Diary** activity to reinforce the message of eating at least five of a variety of fruit and vegetables every day as part of a balanced diet.

Give the pupils the activity sheet and talk to them about how to keep a record of the fruit and vegetables they eat.

Use this activity as the starting point for a class discussion about a healthy, balanced diet. How many pupils have discovered they're not eating enough fruit and vegetables? What might they be eating too much of instead? What food swaps could they make to ensure that they get their 5 a Day?

You could extend this activity with some related maths activities, for example:

- ask each pupil to calculate by how many portions they are falling short of or exceeding the 5 a Day target
- by how many portions of fruit and vegetables is the whole class falling short of or exceeding the 5 a Day target?
- individually, what is the mean number of fruit and vegetables they have eaten across the three days?
- what is the mean number of fruit and vegetables the whole class has eaten across the three days?



If you would like further information on 5 a Day, search [nhs.uk/livewell/5aday](https://www.nhs.uk/livewell/5aday).

### Drink Rethink

D&T

English

Science

Mathematics

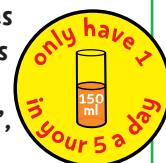
Computing

Tell the pupils that one of the easiest ways to accidentally consume too much sugar is through drink choices.

Introduce the Change4Life Sugar Smart app on an enabled tablet. Show the pupils how to scan the barcode of a product to discover how much sugar it contains. Arrange the pupils into groups or work with the whole class.

Provide a variety of single-serving drink products with barcodes. Drinks should vary in sugar content (see resources section for product types). Using what they know about the app, and the reading of labels, the pupils should investigate the sugar content of the products, before recording their findings on the **Drink Rethink** activity sheet.

Together, as a class, write down the names of products associated with the drink types in the right-hand column. Explain to the pupils that fruit juice is sugary but still counts towards your 5 a Day. They must limit the amount of juice they drink to no more than 150ml and keep it to mealtimes to avoid tooth decay. Also, watch out for 'juice drinks', they're likely to be high in sugar and unlikely to count towards 5 a Day. Sugary drinks have no place in a child's daily diet.



You could extend this activity by getting the pupils to create bar charts based on the tabulated results and by questioning the pupils on the outcomes. For example: which drink had the highest or lowest sugar content? Would any provide you with your entire daily sugar limit?

#### Points to note:

Please be aware that when used on a tablet, rather than a smartphone, the Change4Life Sugar Smart app may require a more steady hand and take longer to register barcodes when scanning. Please also note that not all products (particularly plain water products) are listed on the app. It is recommended that you test your chosen products prior to the lesson.

With older KS2 pupils, you could seek parental permission for the pupils to bring in labelled smartphones, with the app pre-loaded, for use in this lesson.

### Get the whole school involved

Why not encourage every pupil to become a food detective by holding a lunchtime investigators tasting session in the canteen, where pupils can try a new fruit or vegetable they have never eaten before. Pupils who take part can be awarded an **I'm a great food detective** sticker.



## Curriculum links

These activities provide opportunities for meeting the following National Curriculum requirements:

### Science

- gathering, recording, classifying and presenting data (including results) in a variety of ways to help in answering questions
- identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- recognise the impact of diet, exercise and lifestyle on the way their bodies function

### Design and technology

- investigate and analyse a range of existing products
- understand and apply the principles of a healthy and varied diet

### English – spoken

- articulate and justify answers, arguments and opinions
- give well-structured descriptions, explanations and narratives for different purposes

### Mathematics

- read, write, compare and order numbers, solving problems
- solve problems involving addition, subtraction, multiplication and division
- complete, present, read and interpret data/information in bar charts, pictograms and tables
- solve one-step and two-step questions and comparison, sum and difference problems using information presented in scaled bar charts and tables, and other graphs
- calculate and interpret the mean as an average

### Computing

- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- use a variety of software (including internet services) on a range of digital devices

## Finding out more

### Useful Change4Life school links

- you'll find more teaching resources on healthy eating and physical activity on the Change4Life **School Zone**. Search **Change4Life/schools**
- we would love to hear from you. Please send your comments and photos to **partnerships@phe.gov.uk**



### Other useful resources

- the British Nutrition Foundation has more information on the importance of healthy eating at **foodafactoflife.org.uk**
- the Children's Food Trust helps children eat better and so do better, by working with schools, local authorities and other partners. Visit **childrensfoodtrust.org.uk**
- explore how a whole-school approach leads to great school food with the School Food Plan at **whatworkswell.schoolfoodplan.com**
- learn more about promoting school meals with National School Meals Week at **nsmw.org.uk**

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