Zig Zag Education

Food and Nutrition **GCSE (9–1) | AQA | 8585**

2016 specification
first exams in 2018

Food Challenges

For GCSE AQA Food Preparation and Nutrition

Food Choices

zigzageducation.co.uk POD 7983

Contents

Teacher's Introduction

Food Challenges: Food Choices is designed to support students in designing and preparing challenging meals, menus and diets for specific dietary needs and groups of consumers. The Food Challenges were written for those who choose to study the new AQA GCSE Food Preparation and Nutrition specification. We believe that completing the tasks included in this pack will help the students to develop their investigative skills and pass their non-exam assessments with ease as they will enable them to explore the challenges faced in the kitchen, such as *time pressures, temperatures, finishing, cooking methods, and many more.*

What it covers

Food Challenges: Food Choices covers 18 challenging activities, carefully chosen to differentiate in difficulty level the skills needed to complete each challenge and the scientific principles each is based upon. By completing the challenges, students will develop the skills required by the AQA GCSE Food Preparation and Nutrition specification, gain confidence in cooking, and prepare for a future career in the food industry. Each challenge is engaging and creative, supports further learning and allows critical evaluation of students' preparation and cooking skills. Each challenge is followed by a list of questions which help to fix and broaden the knowledge of the students.

How to use this resource

Each challenge consists of three parts:

1. **Teacher's guidance –** includes the aim of the lesson and student outcomes, resources required (including equipment and ingredients), approximate time each challenge will last and a difficulty level, as well as suggested answers and teaching tips. This can be used to support planning of your sessions.
2. **'The challenge: overview'** – includes the ingredient list, the correct procedure, and questions to think about – sometimes you might be asked not to give these to students straight away, as developing a procedure might be a part of the challenge.
3. **'The task'** student worksheets help to structure the work during the lesson(s). Each task is built upon a main focus point, which helps students to recognise and understand the learning objectives of the lesson.

To make the challenge a little bit easier, we suggest to begin each lesson by providing a short introduction of the lesson objectives:

- What the topic or challenge is about
- Physiology/pathology of a given condition or disease
- Dietary management and restriction in a given condition or disease
- What to consider when planning and preparing meals/diets for different consumer groups

You can also schedule this as a homework for students so that they can prepare theoretically for the lesson. Encourage students to research the latest information and professional advice according to the latest scientific data, health professional associations, culinary professionals, etc.

Further points on logistics:

- Before completing any task, make sure you have all resources needed – either provided by the school or brought in by students.
- In the task description, we suggest to split the students into pairs, or groups of three or four – this is for guidance only and can be changed for organisational or safety reasons. Always consider these when planning your lesson, as you might need more or fewer ingredients, tools and kitchen appliances, etc.
- On the ingredients list it is specified how many portions the recipe is for (when possible). Feel free to amend quantities if you don't need as much – and don't forget to amend the cooking time!

Further points on health and safety:

- Make sure there is a working, certified fire extinguisher and/or fire blankets available, especially when handling hot oil.
- Remind students about safety issues when handling raw eggs or other high-risk products, and when dealing with hot ovens/tins/blowtorch.
- Make sure that students who are allergic to any food ingredients do not actively participate in activities which use them! The list of major food allergens is attached at the end of this resource (see appendix). You can print it and hang it in the classroom – this way any student allergic to a food ingredient used during the lesson will know and remember to remind you about it.
- Remind students about good hygiene practice standards (**https://www.food.gov.uk/business-industry/food-hygiene**)

November 2017

COELIAC DISEASE

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

- ✓ Using a pasta machi...
- ✓ Making ...ou...
- ✓ Using ...e...
- ✓ Wate... ...ed cooking methods
- ✓ Adjusting recipes for gluten-intolerant people

LEARNING O...

...tudents should be able to:

- ❑ identify foods that are safe for ...
- ❑ know how to choose and use v... gluten-free, yet balanced diet
- ❑ be aware of the dangers gluten ... coeliac disease
- ❑ understand the importance of ... of foods

SAFETY TIPS

! Make sure that students who are allergic to **wheat** or **eggs** do n... the challenge (encourage them to measure times and write no...

! Remind students about the safety rules when handling high-risk ... they apply them to prevent cross-contamination of foods with ...

EXTEND LEARNING

+ If you have more time, yo... ...e... ...urage students to try recipes for gluten-f... **https://www.do...e... ...c...uk/recipes/gluten-free-oven-baked-white-brea...**

+ Various ...hapes can be found at **https://pastafits.org/pasta-dictionary/**

WHAT YOU WILL NEED:

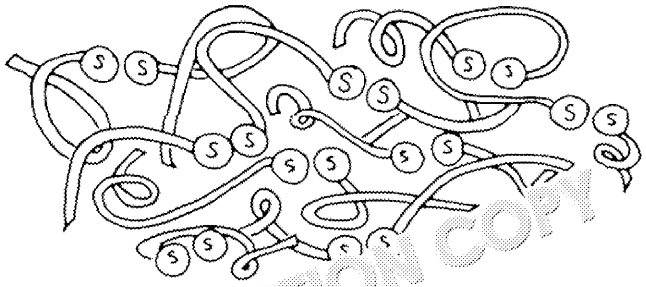
Equipment:	
✓ Pasta machine ✓ Rolling pins ✓ Large saucepans ✓ Cooker ✓ Food processors ✓ Large bowls ✓ Strainers ✓ Kitchen scale ✓ Precise ruler (possibly a metal o... ✓ Timer (students can use ... ...ime... ...n their smartphones)	✓ Va... va... ind... wo... ✓ Oli... ✓ **Egg...** ✓ Salt ✓ Xa...

2.

Gluten-containing flour	Glute
• **wheat plain flour** • **strong wheat flour** • **rye flour** • **barley flour** • **spelt flour** • **oat flour** – if not certified (may be contaminated)	• buckwheat flour • rice flour • maize flour / cornsta • tapioca flour • potato starch • chestnut flour • chickpea flour • quinoa flour • millet flour • teff flour • soy flour • amaranth flour • sorghum flour • oat flour – if certified

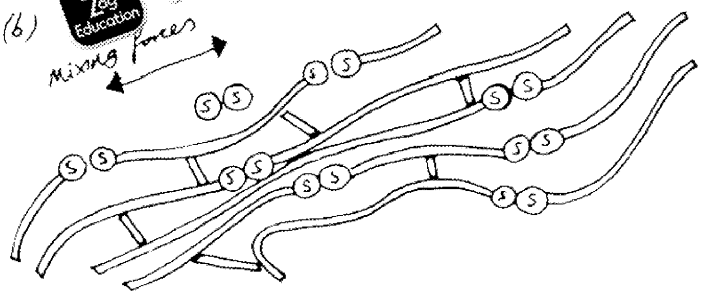
3.

(a)



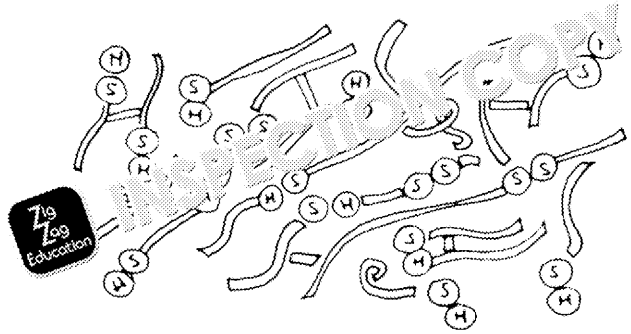
In flour, long glutenin [illegible] long strands) and gliadin fibres (the curly strands) a

(b)



After adding water to the flour, the glutenin and gliadin begin to create a more ord net (in this diagram the hydrogen bonds between protein strands are clearly visible)

(c)



However, if you overdo the dough, the chemical bonds between protein strands be its firm and elastic texture.

4. **Xanthan gum**, used in many recipes, is a thickening agent and a stabiliser, which he separating. In pasta, xanthan gum is used in the absence of gluten to make the dou

5. A resting period is needed so that gluten develops properly. During resting, gluten f stabilise the texture of the dough. If it was not rested but cooked immediately, the cooking – which may not be welcome, especially if you were trying to make a stuffe would cause the dough to push the filling out.

9. When rolling a gluten-free pasta in a rolling mach ne. n should not use the narrow elastic enough and would tear.

10. Shapes of pasta to inc a limited to: *fusilli, lasagne, linguine, pappardelle,*

12. Studen d observe differences in sensory characteristics between different ty
    - Glu ee pasta should be less elastic and crumbly than classic pasta.
    - Gluten-free pasta also cannot be rolled as thin as classic pasta, so will provide and more dry).
    - Gluten-free pasta can also taste starchy or bitter, but the result will depend or (e.g. whether the pasta was rested, cooking time).

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. Marmite is a by-product of beer and wine production, and could contain traces of g consumed in very small amounts it is considered safe.
   Source: https://www.coeliac.org.uk/about-us/news/yeast-extract-update/

2. Apart from bread, cakes and cookies, this can include, for ex ple, beer (made of b wheat), fish fingers, fish cakes, gravy.

3. Examples:
    - Ensure that the wo e is properly cleaned and disinfected
    - Ensu hat used is certified as gluten-free
    - En at the flour is stored separately from any gluten-containing products
    - Stu should avoid cross-contamination of the bread with gluten. For this r gluten-containing products (such as normal wheat flour, rye flour or even sour area. This is to ensure that students do not contaminate their gluten-free brea

   Any other suitable suggestion.

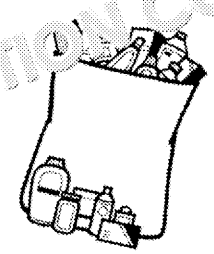
COELIAC DISEASE

THE CHALLENGE OVERVIEW

Gluten is a complex protein which is created when you mix flour with water, e.g. when making bread. In most people, people it is normally digested, but in some people, such as coeliacs, it can't be.

Gluten consumption by coeliacs leads to damage of the intestines' mucous membrane and degeneration of the villi. This in turn causes the villi to deteriorate, which affects absorption of all nutrients and causes various symptoms, from pain to severe diarrhoea in the short term, and nerve damage in the long term. For this reason coeliacs have to avoid gluten in all forms and amounts. This may be a bit tricky, since this protein is widely available in various cereals and food products – that's why gluten-free foods need to be clearly labelled and handled separately from non-gluten-free ones.

Your challenge is to make gluten-free pasta. Make sure you choose the right flour and/or binding agent!

INGREDIENTS		PROCEDURE	
Pasta (basic): ❑ 1 **egg** ❑ ½ tsp salt ❑ 140g **plain flour** ❑ 2 tbsp **olive oil** **Pasta (gluten-free):** ❑ 150g rice flour ❑ 50g potato starch ❑ 1 tbsp cornflour ❑ 2 tbsp xanthan gum ❑ ¼ tsp salt ❑ 3 **eggs** ❑ 1 tbsp oil ***Source:*** • *http://allrecipes.co.uk/recipe/7204/basic-homemade-pasta.aspx* • *http://www.jamieoliver.com/recipes/pasta-recipes/gluten-free-pasta-dough/*		1	Combine all ingredients in a food processor to form a dough.
		2	Remove from the processor and knead until smooth.
		3	Roll into a flat sheet with a rolling pin or a pasta machine.
		4	Cook in salted boiling water for 3 minutes or until al dente.

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. Is Marmite safe for coeliacs? (3.2.3.1)
2. What popular foods cannot be eaten by coeliacs? (3.2.3.1)
3. What can you do to ensure that your bread is not contaminated with gluten?

THE CHALLENGE: COELIAC – THE GUILT IS ON G

YOUR TASK

Divide into small gro… three or four. In each group try to prepa… types of fl… Two groups need to make a classic pasta (using a ty… gluten) a… other groups have to make gluten-free pastas. Begin b… below wh… kind of flour you CAN or CANNOT use.

You probably know from previous lessons that gluten is a protein wh… stick together – so avoiding it may lead to a complete failure! If yo… free pasta, think about different ingredients which can help you to … gluten-free pasta.

1. Making a pasta begins by choosing the correct type of flour.

   I am cooking... ☐ classic pasta ☐ gluten-free pasta

2. Mark all the kinds of flour which you can use in your recipe:

Buckwheat flour		Chestnut flour	
Wheat plain flour		Chickpea flour	
Strong wheat flour		Quinoa flour	
Rice flour		Millet flour	
Rye flour		Teff flour	
Barley flour		Oat flour	
Maize flour / cornstarch		Soy flour	
Spelt flour		Amaranth flour	
Tapioca flour		Sorghum flour	
Potato starch			

3. Draw three diagrams to show how gluten forms in flour.

A

B

4. Look up the recipes on the overview page. What is the role of xanthan gum i

.....

.....

5. Once your dough is ready, wrap it in cling film to ... or 30 minutes. Why d

.....

.....

.....

.....

6. Time to roll the pasta. Are you going to use…

☐ a rolling pin? or ☐ a pasta machine?

7. How long did it take you to roll your pasta?

.....

8. How thick is your pasta? Try to measure it very caref...

.....

.....

9. If you d... to use the pasta machine – did you use the narrowest setting? What is the outcome?

.....

.....

.....

.....

10. Give your pasta a shape – you can make it into spaghe... tagliatelle, tortelli... different shapes of pasta – and try to name th... c... ectly!

11. It's time to cook your pasta.

    i. How long did it take to cook properly?

    .....

    ii. Was it shorter or longer than the other type of pasta?

    .....

12. Once your pasta is cooked drain it well on a strainer and serve. Take a few minutes to taste it to the other type of pasta made in class.

	GLUTEN-FREE PASTA	
Texture		
Appearance		
Flavour		
Mouthfeel		

EVALUATION

Take some time to evaluate this challenge. Writing down anything you would potentially change next time.

.....

.....

.....

.....

Wheat Allergy

Teacher's Guidance

What's covered in this session:

- ✓ Planning meals and [illegible] for specific dietary groups: wheat allergy

Learning Outcomes

Pupils should be able to:

- ❑ explain the difference between wheat
- ❑ identify different varieties of wheat a
- ❑ modify recipes and choose ingredients people who are allergic to wheat while
- ❑ identify various functions of flour in c

Safety Tips

! Make sure that pupils with an allergy to **wheat**, **milk** or **eggs**, or not actively participate in the activity.

! Remind students about the safety rules when handling high-risk they apply them to prevent cross-contamination of foods with

What you will need:

Equipment:	I
✓ Baking tins or trays ✓ Baking paper ✓ Large [illegible] ✓ Cooki[illegible]rs ✓ Oven	There is a wide variety complete this activity. worksheet for guidance other foods not include

Activity Answers

1. Functions of the self-raising flour in a recipe for scones are:
   - to add bulk to the dough
   - to give texture (dense and sponge-like)
   - to allow raising during baking (it contains chemical raising agents; when they a carbon dioxide is produced, which then expands and [illegible]es the dough to rise)

4. Students may opt to use xanthan gum, guar [illegible], a[illegible] egg yolks or other thickeners to

'Questions to think about' answers:

1. - Du[illegible]duction, bran is separated from the flour, so its nutritional value is d
   - For[illegible]tion helps to restore and improve the nutritional value of flour.
   - Substances added to flour by law are *calcium, thiamine, iron* and *niacin*.

2. The stages of gelatinisation include:
   - 60°C – the starch granules begin to absorb water and swell
   - 80°C – the starch granules begin to burst open and release the starch to the so
   - 100°C – the gelatinisation process is finished, the solution is fully thickened – f becoming thinner again

3. Examples could include:
   - brunch (eaten instead of breakfast and lunch around midday)
   - elevenses (small snacks eaten around 11am)
   - lunch (eaten in the early afternoon)
   - afternoon tea (late afternoon meal consisting of sandwiches, cakes, and a pot o

WHEAT ALLERGY

THE CHALLENGE OVERVIEW

Although wheat allergy isn't the most common allergy, people who suffer from it can have a really difficult time when shopping and trying to choose products which are safe for them. Wheat has many varieties, such as durum, khorasan or spelt, and each of them can trigger an allergic reaction. In the most severe cases, traces of wheat can trigger a life-threatening reaction called anaphylactic shock. Remember that wheat can be used in food products in many various forms, e.g. as whole grains or groats, as flour in many various products, or as wheat germs or wheat germ oil. Those allergic to wheat need to read food labels very closely to make sure the product is safe for them.

Your challenge is to bake wheat-free scones. Below you will find a basic re
Your task is to modify it to obtain equally good, wheat-free scones. Remem
to avoid potential cross-contamination!

INGREDIENTS		PROCED	
Scones (basic): ❑ 225g self-raising **wheat flo** ❑ 55g **butter** ❑ 25g ca ga ❑ 150ml ❑ ¼ tsp salt ❑ 1 **egg** to glaze ***Source:*** • *http://www.bbc.co.uk/food/recipes/scones_1285*		**1**	Preheat the oven
		2	Place flour and sa and add butter (c
		3	Rub the butter in
		4	Add the milk to o then knead gentl
		5	Cut out scones w place them in a b paper and glaze v
		6	Bake for 15 minu

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. Wheat flour is fortified by law in the UK. Explain why and list substances that are adde
2. Flour is often used as a thickening agent in sauces due to gelatinisation. Describ
3. Scones are often eaten as part of a cream tea. List other mealtimes / eating British {3.5.2}

THE CHALLENGE: WHEAT A
WHOLE BAG OF TRI

YOUR TASK

Divide into groups of [illegible]. Each group you will prepare scones u
of flour.

Group 1 will prepare classic scones, which will be used as a compa
recipes. See the challenge overview page for the recipe.

The other groups' task is to modify the recipe for scones so that they
beware! The various kinds of flour can only be used once – this mea
to use cornmeal, no other group can use it! Are you ready for the c

1. First, think about the functions of self-raising wheat flour in the recipe for sc

.....

.....

.....

2. Having that in mind, choose what kind of flour you are going to use from the
types of flour – but remember that this will prevent other groups from using

Amaranth flour		Quinoa	
Buckwheat flour		Rice flour	
Cornstarch		Chickpea flour	
Potato starch		Soy flour	
Millet		Coconut flour	
Oatmeal		Almond flour	
Rye flour		Tapioca flour	
Barley flour			

3. Why did you choose these ingredients? Justify your choice!

Flour 1 .....

Flour 2 (if used more than one) .....

Flour 3 (if used more than one) .....

Flour 4 (if used more than one) .....

4. Are there any other ingredients you need to prepare your scones? List them of each one in the recipe!

.....

.....

.....

.....

5. Follow the procedure on the overview page or amend it slightly to obtain the scones you like. When baking, describe below what ingredients were used by each group.

Group 1 – basic recipe

	Types of flour used	Other ingredients
Group 2		
Group 3		
Group 4		
Group 5		

6. Once all the scones are baked, set up a tasting panel to compare them to the basic recipe. Are the different kinds of flour are a good substitution for wheat flour.

Use a 1 to 9 scale where 1 stands for 'poor' and 9 stands for 'excellent'.

	Scones (basic)	Wheat-free scones 1	Wheat-free scones 2
Appearance			
Texture			
Colour			
Density			
Sweetness			
Aroma			
Moistness			
Overall palatability			
Total:			

7. Who managed to obtain the best replacement for wheat flour?

.....

.....

.....

.....

EVALUATION

Take some time to evaluate this challenge, noting down anything y would potentially change next time.

.....

.....

.....

.....

ALLERGY TO EGGS

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

- ✓ Using an oven
- ✓ Functi[illegible] cooking
- ✓ How [illegible]p a tasting panel
- ✓ Egg substitutes in cooking

LEARNING O[illegible]

Students should be able to:

- ❑ understand the difference betw[illegible] intolerances
- ❑ choose egg substitutes depend[illegible] the recipe
- ❑ indicate other important food a[illegible]
- ❑ understand the importance of a[illegible]

SAFETY TIPS

! Remind students about the safety rules when handling high-risk f[illegible] apply them to prevent cross-contamination of foods with eggs o[illegible]

! Make sure that pupils with allergy to **eggs**, **milk** or **wheat**, or glu[illegible] actively participate in the activity.

GUIDANCE FOR TEACHING:

You can give the overview page t[illegible] prior to the lesson so that they can b[illegible] with them.

WHAT YOU WILL NEED:

Equipment:	I[illegible]
✓ Flat baking tins	
✓ Muffin baking tins	There is a wide variety [illegible]
✓ Paper muffin cases	complete this activity. [illegible]
✓ Baking paper	worksheet for guidanc[illegible]
✓ Whisks, hand mixers or food processors	other foods not includ[illegible]
✓ Large bowls	consider asking student[illegible]
✓ Piping bags	ingredients from home[illegible]
✓ Ovens	

ACTIVITY ANSWERS

2. Egg substitutes for meringues could include:
   - aquafaba (chickpea brine)
   - butter bean brine or brine from any other kind of legume
   - agar powder mixed with water in equal proportions (1 tbsp of agar powder to 1

   Egg substitutes for muffins could include:
   - apple sauce
   - mashed pumpkin
   - yoghurt
   - veg[illegible] oil
   - m[illegible] bananas
   - gro[illegible] flaxseed mixed with warm water

3. Functions of eggs in meringue:
   - raising agent
   - bulk agent

   Functions of eggs in muffins
   - binding agent
   - adding nutritional value

5. Egg substitutes in recipes (examples):
   - leavening agents – baking powder mixed with apple sauce, vinegar and baking of soda
   - binding agents – silken tofu, apple sauce, flax seeds, banana puree
   - colourants – curcumin
   - glaze – water, milk (either pure or mixed wi[illegible] sweet pastries)
   - flavouring – silken tofu, pumpkin [illegible] puree, apple sauce
   - thickening agent – xantha[illegible] gum, agar, gelatin

   For grou[illegible]
   Sugges[illegible] to prevent cross-contamination of food with eggs could include:
   - usi[illegible]erent workstations to handle egg-free dishes/meals
   - properly cleaning and disinfecting working surfaces and utensils
   - washing hands before and after handling eggs
   - ideally, preparing eggless dishes/meals in a separate room

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. Symptoms of anaphylactic shock may include: itchy rash, swelling of the tongue and vomiting, drop in blood pressure, feeling light-headed, and even cardiac arrest.

2. The other allergens on the list include: celery, cereals containing gluten, crustaceans, mustard, tree nuts, peanuts, sesame seeds, soy, sulphur dioxide and sulphites.

3. Egg production methods include:
   - **Enriched cage egg production** – the h[illegible] ha[illegible] very limited space for perching placed on top of each othe[illegible] space
   - **Barn egg productio[illegible]** the birds can move freely around the barn, have more in cag[illegible]pro[illegible]
   - **Fi[illegible]e** - the hens are let outside of the barn for at least part of the day
   - **Or[illegible]** the hens are let outside and are fed organic feed

Allergy to Egg

The Challenge Overview

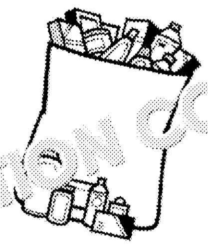
In the UK we consume over 12.5 million eggs ... ar ... But there are people among us who cannot eat th... ...e ...health (or other) reasons. It is estimated that u... ...children and 2% of adults suffer from a food allergy – in... ...ergy to eggs. Severe allergies may lead to life-th...at... ...aphylactic shock – and for those people it is crucial to ... th... allergen in their diet. Eggs are used in the industry for multiple ...ons – not only in food products, but also to produce vaccines, paints, wines, liquors and cosmetics, for biotechnology, etc.

Your challenge is to make an eggless dish – choosing between meringues a... choose egg substitutes wisely so that the flavour and texture of your dish i... to apply food safety rules to avoid potential cross-conta...

Ingredients

Meringue (basic):

- ❑ 3 **egg** whites
- ❑ 150g caster sugar
- ❑ 1 tbsp vinegar



Muffins (basic):

- ❑ 2 **eggs**
- ❑ 125g oi...
- ❑ 250g ...
- ❑ 200g s...
- ❑ 400g **flour**
- ❑ 1 tsp salt
- ❑ 100g chopped chocolate

Source:

- *https://www.bbcgoodfood.com/recipes/2331641/basic-muffin-recipe*

Safety Tips

! Make sure you handle eggs with care and avoid cross-contamination, as it could trigger a life-threatening reaction in those allergic to them!

Proced...

	For t...
1	Whisk the egg whi... form
2	Sift in the sugar a... mass is shiny and s...
3	Add the vinegar a... time to combine t...
4	Using a piping bag, ... meringues on a ba... baking paper
5	Bake at 140°C for ... meringues come o... paper
	For ...
6	Combine the wet i... bowl and whisk lig...
7	Add the dry ingre... roughly – the mixt... be smooth
8	Fill muffin cases t... bake for 20 minut...

Questions T... ...k About!

Discuss thes... ...tions with a partner or make notes in your books.

1. What are the symptoms of anaphylactic shock? (3.5.1.2)
2. Eggs are one of the 14 allergens which have to be shown on food packaging ... other 13? (3.5.1.3)
3. Research various methods of egg production and explain the differences betwee...

THE CHALLENGE: ALLERG
– A HARD EGG TO C

YOUR TASK

Divide into six grou[illegible] each group will have a different task to perf
- **Grou[illegible]** will [illegible] prepare classic meringues using the recipe shown o
- **Grou[illegible]nd 3** will prepare eggless meringues – do the researc different products which can substitute egg whites in the recipe
- **Group 4** will prepare classic chocolate chip muffins using the re overview page.
- **Groups 5 and 6** will prepare eggless muffins – do the research c products which can substitute eggs in the recipe.

Groups 1 and 4 also have an additional task: since you are using e need to research and list proper ways of preventing cross-contam made in class! At the end of the lesson you will need to present yo Make sure your advice is useful and helps to make the others' dish

At the end of the lesson you will compare all of the meringues and see if you chose your substitutes well!

1. Tick which group you belong to:
   - ❑ Group 1
   - ❑ G[illegible]
   - ❑ Gr[illegible]
   - ❑ Group 4
   - ❑ Group 5
   - ❑ Group 6

2. If you are in one of the 'eggless' groups, describe below how you are going t

3. What is the fun[illegible] eggs (substitute) in your recipe?

.....

.....

4. Why do you think your egg substitute is going to be effective?

.....

.....

.....

.....

.....

5. Eggs ar[illegible] in cooking for many various reasons. Research how to substit[illegible] them as:

a leavening agent .....

a binding agent .....

a colourant .....

a glaze .....

a flavouring .....

a thickening agent .....

6. Once all the dishes are made, set up a tastin[illegible] pa[illegible] compare them and se[illegible]

Use a 1 to 9 scale where 1 [illegible]nd[illegible] f[illegible] unacceptable' and 9 stands for 'excelle[illegible] of the dishes both [illegible]tside and on the inside, then assess the texture [illegible] make [illegible] to [illegible]ow how they differ from each other.

	Classic meringue	Eggless meringue 1
Colour		
Crunchiness		
Crispiness		
Shape		
Stickiness		
Sweetness		
Other:		
Other:		
Total:		

i. W[illegible]e[illegible] [illegible]scored the most? Were the egg white substitutes effe[illegible]

.....

.....

.....

ii. Which muffins scored the most? Were the egg substitutes effective in

.....

.....

.....

.....

Groups 1 and 4

In your reci... a ... using eggs, which are a potent allergen. Suggest ways to ... food with eg... his can be useful for your classmates from other groups! (And ...

EVALUATION

Take some time to evaluate this challenge, noting down anything y... would potentially change next time.

.....

.....

.....

.....

VEGETARIANS AND VE

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

- ✓ Using an oven / dr... / grillin... meth...
- ✓ Modif... recipes to meet requirements of specific dietary groups

LEARNING OUT...

...ils should be able to:

- ❑ explain the differences between vario... veganism
- ❑ choose the ingredients to suit the give...
- ❑ modify recipes to create meat-free dis...
- ❑ identify health benefits of a diet rich i...
- ❑ identify and prevent risk of malnutriti...

SAFETY TIPS

! Make sure that pupils with allergy to **eggs**, **wheat** or **fish**, or with ... actively participate in the activity.

! Remind students about the safety rules when handling hot dish...

GUIDANCE FOR TEACHING:

You can give the overview page to stude... ...r ...ne lesson so they can do the... necessary ingredients with them.

WHAT Y... WILL NEED:

Equipment:	I...
✓ Oven or cooker	✓ There is a wide va... complete this act... worksheet for gui... use other foods r...
✓ Baking tins or frying pans or grill	
✓ Food processors	
✓ Large bowls	
✓ Chopping boards	✓ Various herbs, sp... to choose from
✓ Knives	

ACTIVITY ANSWERS

2.
   - **Ingredients suitable to prepare classic burgers:** all
   - **Ingredients suitable to prepare vegetarian burgers:** all except for minced bee
   - **Ingredients suitable to prepare vegan burgers**: mushrooms, tofu, TVP, courge cauliflower, potatoes, quinoa, millet

3. Students may choose to chop, mince, mash or bl… …e … …gredients. Depending … will differ. It is up to students to decide … …e… …d they are going to use and wh…

4. Umami taste can be pr… … …xample, with mushrooms, cheese or soy sauce.

7. The mi… …in … should be fine, sticky and moist, and hold together when shape… lack of r… …e will cause the burgers to fall apart after cooking.

11. Since baking usually takes longer, burgers which were baked should be drier and hav… were dry-fried. The final result depends on many factors, such as the cooking time a…

Group 1 – additional task:
Nutrients which may be lacking in a vegan diet and ways to prevent deficiencies:

Nutrient	How to …
protein (plant-based foods usually contain low biological value protein only)	include plenty of soy and … biological value protein apply protein compleme…
vitamin D (it is not present in plant foods except for mushrooms)	increase consumption of … ens…re appropriate sunli… …duced in the skin in r…
vitamin B12	since this vitamin only oc… might need to take vitam…
calcium (although many plant … are … in calcium, its absorption is affected … …h levels of fibre)	consider consumption of … as bread, breakfast cerea…
iron (non-h… …n i… not absorbed as well as haem iron from meat)	to increase iron absorpti… vitamin-C-rich foods
iodine	increase consumption of …

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. **Vegetarians** do not eat meat and meat products (ham, sausages etc.) but may eat e… Depending on that, they can be divided into:
   - lactoovovegetarians (eat both eggs and dairy)
   - lactovegetarians (eat dairy, but not eggs)
   - ovovegetarians (eat eggs, but not dairy)
   - pescovegetarians (eat fish)

   Vegans do not eat any produce of animal origin, mea… …at … their diet there are anything made from or by animals. A vegan d…et … sh… …y based on plant foods.

2. Red meat is associated with … …eral … …an conditions and diseases, such as high blo… atherosclerosis, cor… …v… …disease and bowel cancer. Reducing red meat cons… lower th… …of … …seases.
3. Since v… … not eat any animal products, their diet may be low in vitamin B12, … B12 and … …min D occur almost exclusively in animal foods, while calcium and iron … amounts and are usually better absorbed by the body than when they come from p…

4. Reasons could include:
   - medical (e.g. allergies to animal food products, such as milk or eggs)
   - moral and ethical beliefs (e.g. animal welfare, global warming)
   - religious (e.g. Hinduism)
   - socio-economical (price of meat and fish is very high)

5. A vegan diet cannot be balanced properly since there are nutrients which are found
   prevent deficiencies, vegans may consider taking dietary supplements. Note that su
   considered a part of a healthy, balanced diet.

   Balancing a vegan diet may also be difficult due to the high amount of dietary fibre, wh
   micronutrients in the int

   Note th e plant foods, such as spinach and sorrel, are high in oxalates, which c
   kidney s In order to prevent them, we mix spinach and sorrel-based dishes w
   with oxalates) – but this cannot be done in a vegan diet, so vegans may be at a highe

   However, it is worth saying that a vegan diet should NOT be considered harmful or u
   various nutritional needs and for some of them a vegan diet may be just as sufficien

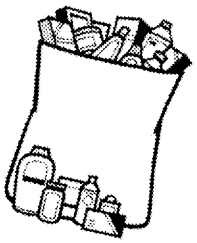
VEGETARIANS AND VI

THE CHALLENGE OVERVIEW

It is estimated that around 3% of the British population is either vegetarian or vegan according to the National Diet and Nutrition survey. This may seem a low amount, but in fact it is a group of almost two million people who choose not to eat animal foods for various reasons. While a vegan diet is based on plant foods only, various groups of vegetarians may choose to eat either milk and dairy, eggs, fish – or all of them. For this reason we can divide them into lactovegetarians, ovovegetarians, lactoovovegetarians and pescovegetarians.

Balancing a vegetarian or vegan diet may be a really tough task, especially lacking some of the macro- or micronutrients. A very high amount of dietary desired, may cause digestive problems and impair nutrient absorption in the balanced vegan or vegetarian diet is healthy and provides all nutrients required – and more and more people choose these diets due to various reasons.

Your challenge is to make vegetarian- or vegan-friendly burgers. Your task is that the burgers taste similar to those made of meat – even though it Are you ready?

INGREDIENTS	PROCEDURE	
Meat burger base: ❑ 750g lean beef ❑ 1 **egg** ❑ 2/4 tsp salt ❑ 200g **breadcrumbs** ❑ 1 tbsp **Worcestershire** sauce ❑ 1 onion ❑ 1 tbsp chopped parsley  ***Source:*** • *http://www.foodrepublic.com/recipes/best-basic-burger-recipe/*	**1**	Chop the onion and
	2	Place all of the ingredients in a bowl and mix until
	3	Form burgers making sure they are even in shape and
	4	Grill, bake or dry-fry on both sides until golden

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner. Make notes in your books.

1. What is the difference between vegetarianism and veganism? (3.2.3.1)
2. What are the advantages of cutting down consumption of red meat?
3. What nutrients can be lacking in a vegan diet? Why? (3.2.3.3, 3.2.3.1)
4. Why do people choose to follow a vegetarian or vegan diet? (3.5.1.2)
5. Is it possible to balance a vegan diet to provide all macro- and micronutrients?

THE CHALLENGE: VEGETAR
VEGANS – MEATLESS B

YOUR TASK

Divide into groups. Fo[illegible] will try to make their own burgers.

- Group 1 will [illegible] classic burgers following the recipe on the
- while [illegible] groups will experiment with various ingredients.

Your task is to make vegetarian- or vegan-friendly burgers which ar[illegible] texture to those made of meat, even if they contain none. Think of [illegible] will need to substitute in the recipe to obtain the final result. Divide [illegible] portions and shape into burgers – you will need to dry-fry half of the[illegible] half.

Group 1 also has an additional task. After you have cooked your b[illegible] research the potential macro- and micronutrients which might be [illegible] You need to provide two examples of how to avoid these nutrition[illegible] worksheet provided to help you.

1. Begin by stating what kind of burgers you will be preparing.

   - ❑ Classic
   - ❑ Vegetarian
   - ❑ Vegan

2. From th[illegible] be[illegible]k the ingredients which you are going to use. Make s[illegible] target [illegible]

Minced beef		Lentils	
Quorn™		Cauliflower	
Mushrooms		Potatoes	
Tofu		Quinoa	
TVP		Millet	
Courgette		Feta cheese	
Beetroots		Chickpeas	
Eggs		Other:.....	
Beans		Other:.....	

3. Once you have chosen you[illegible], describe how you are going to obta[illegible] classic meat burger[illegible]

.....

.....

.....

4. Meat is a source of umami taste. How are you going to provide that taste in

.....

.....

5. List all the herbs, spices, condiments and ingredi... ...h you are going to
in taste to the classic meat burgers.

.....

.....

.....

.....

.....

6. Once you have made your batch of raw ingredients, compare the texture of

Use a 1 to 5 scale where 1 means 'no, poor' and 5 means 'yes, excellent'.

	Meat burgers	Meatless burgers 1	Meatless burgers 2	Mea... burg...
Is the mince fine?				
Is the mince sticky enough?				
D... the ... stick to... when formed into burgers?				
Is the mince moist enough?				

7. Which batch scored the most? How do you think this will affect the texture

.....

.....

.....

.....

.....

8. Form the burgers, making sure that they are even in size and shape, as this w
cooking evenly. Dry-fry half of them, and bake the other half. Then assess a
compare their texture and flavour to those made of meat.

Use a 1 to 5 scale where 1 means 'no, poor' and 5 means 'yes, excellent'.

i. Dry-fried burgers

	Meat	Meatless burgers 1	Meatless burgers 2	Meatl burge
Do the bur s ta e when lifted?	5			
Are the burgers moist?	5			
Are the burgers browned on the outside?	5			
Is the aroma similar to those made of meat?	5			
Is the texture similar to those made of meat?	5			
Is the taste similar to those made of meat?	5			
Total:				

ii. B ur

	Meat burgers	Meatless burgers 1	Meatless burgers 2	Meatl burge
Do the burgers maintain their shape when lifted?	5			
Are the burgers moist?	5			
Are the burgers browned on the outside?	5			
Is the aroma similar to those made of meat?	5			
Is the texture similar to t o eat?	5			
e taste similar to those made of meat?	5			
Total:	30			

9. After the assessment, which substitute provided the texture most similar to

.....

.....

10. Which substitute provided the taste most similar to [illegible]?

.....

.....

11. How did the cooking methods affect the texture and moisture of the burger

.....

.....

12. Is it possible to make vegetarian/vegan-friendly burgers which are similar in t of meat? What went well and what went wrong when preparing the vegeta

.....

.....

.....

.....

.....

.....

EVALUATION

Take some time to evaluate this challenge, noting down anything y would potentially change next time.

.....

.....

.....

.....

Group 1

You have prepared classic beef burgers. While waiting for other groups to comp
nutrients which may be lacking in a vegan diet and ways of preventing nutritiona

Nutrients which may be lacking in a vegan die

Ways to prevent nutritional deficiencies in vega

VEGAN DIET

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

- ✓ Planning meals and d… special … vega…
- ✓ Interp… food labels – differentiating between vegan and vegetarian foods

LEARNING OU…

Students should be able to:

- ❑ understand the principles of vegan…
- ❑ identify potential risks of a vegan d… B12 deficiency, protein deficiency
- ❑ combine ingredients to apply prote…
- ❑ choose ingredients and modify reci… and the nutritional value

SAFETY TIPS

! Make sure that pupils with an allergy to **lupin**, **celery**, **wheat**, **ba**… with gluten intolerance, do not actively participate in the activi…

GUIDANCE FOR TEACHING:

To make the competition even more difficult, consider brin… only a limited am… 200g of each listed product). This way, students w… av… to experiment more as… number of ingredients.

WHAT YO… W… ED:

Equipment:	I…
Standard cooking equipment: saucepans, frying pans, oven, cooker, chopping boards, knives, spoons, etc.	There is a wide variety … complete this activity. … worksheet for guidanc… other foods not includ…

ACTIVITY ANSWERS

7. Some popular foods served in restaurants on a daily basis include hummus, which i… and sesame. Another popular example is beans on toast, often available in breakfa…

'QUESTIONS TO THINK ABOUT' ANSWE…

1. Protein complementation is a techni… in … h two or more sources of low biolog… obtain a high biological valu… otei…

2. Exampl… d i…
   - hu… a mix of chickpeas and sesame)
   - Mexican tortillas (wheat tortillas with a bean-based filling)
   - beans on toast (cereals from bread complement the beans)
   - or any other suitable example

   Note that the examples should NOT include any product of animal origin (such as m… examples also should NOT include plant sources of whole proteins, such as soy or q…

VEGAN DIET

THE CHALLENGE OVERVIEW

Vegans base their diet on plant foods only. This means that they cannot use foods such as butter or honey, and many of them refuse to wear leather clothing. And, although a vegan diet is usually high in fibre and vitamin C, it may lack high biological value protein, B12 vitamin, vitamin D, calcium and other micronutrients. As a result nutritional deficiencies may develop, leading to various health issues. Some of these deficiencies cannot be avoided by any food complementation technique – as a result, doctors and dietitians may advise their vegan patients to take vitamin supplements.

To provide high biological value protein, vegan dishes usually apply a protein complementation technique. It means that two sources of low biological value proteins are combined so that one complements the amino acid which is lacking in the other one, and vice versa.

Your challenge is to prepare a vegan-friendly dish which will provide high b
task is to only use the food products listed belo

Foods rich in lysine	Food
• Chickpeas	• **Wheat** flour
• Broad beans	• **Barley** groats
• Red l	• Brown rice
• Gree	• **Walnuts**
• **Lupin**	• **Almonds**
• Kidney beans	• **Cashew nuts**
• Onions	• Flax seeds
• Carrots	• Pumpkin seeds
• Chicory	• Sunflower seeds
• **Celery**	• **Sesame**

… plus water, vegetable fat, herbs and spices. You have 45 minutes to prepare

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. What is protein complementation? (3.2.
2. What popular dishes apply protein complementation technique? (3.2.1.1, 3.5.2)

The Challenge: Vegan D
for Compli(e)men

Your Task

To provide whole [illegible], vegans often need to mix various foods
of the a[illegible]. On the overview page there is a table which s
high and [illegible] are low in lysine – one of the essential amino acids

Your task is to prepare a vegan-friendly dish using only the ingredie
water, vegetable oil, herbs and spices. You cannot use any other

Work in pairs to develop as many vegan-friendly recipes as possibl
plan and prepare your dish, so… ready, steady, go!

1. I am going to prepare:

.....

.....

2. The ingredients I am going to use ar

.....

.....

.....

.....

3. The cooking methods used in my recipe are:

.....

.....

.....

.....

4. Fill in the table to explain how you prepared your dish, step by step.

	Procedures:
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Your time for completion:

.....

5. Once all the dishes are [illegible], set up a tasting panel. Use a preference te
out the b

	Dish 1	Dish 2	Dish 3	
Name of the dish				
How many people favoured it over other dishes?				

6. Imagine you are the manager of a vegan restaurant. Would you serve any o
your restaurant? Why / why not?

.....

.....

.....

.....

.....

.....

7. Find a menu from a vegan restaurant online. Try to find meals which apply t technique.

.....

.....

.....

.....

.....

.....

EVALUATION

Take some time to evaluate this challenge, noting down anything y would potentially change next time.

.....

.....

.....

.....

HIGH-PROTEIN DIET

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

✓ Planning meals and d... special d... tar... ...high-prote...

LEARNING O...

...tudents should be able to:

- ❑ understand and explain why so... protein than others
- ❑ plan and modify recipes to adju... (high protein, portion size, calo...
- ❑ explain the functions of protein... effects of excess and deficiency

SAFETY TIPS

! Make sure that pupils with any kind of food allergy (for example... intolerance do not actively participate in the activity.

GUIDANCE FOR TEACHING:

- ➢ The activity is open to help students develop the... ...g skills. You can co... worksheet to students prior to the lesson so that they can prepare the theo... the ingredients they are plann... ...us...
- ➢ If you want to make th... ...more complex, consider preparing some ing... so that th... ha... ...elop recipes using only the ingredients available.

WHAT YOU WILL NEED:

Equipment:	I...
Standard cooking equipment: saucepans, frying pans, oven, cooker, chopping boards, knives, spoons, etc.	Students should have t... their own ingredients. ... basic ingredients, such... spices and dried herbs...

Activity Answers

1. Some foods rich in protein which might be useful in preparing the snack include:
   - meat, poultry and fish (roasted, grilled, steamed, smoked, cured), to include c
   - eggs
   - dairy products (cheese, cottage cheese, yoghurt)
   - quinoa
   - beans, chickpeas and lentils
   - almonds and other nuts
   - edamame beans, soy and [illegible]ts, e.g. tofu
   - Quorn™

'Questio[illegible]to think about' answers:

1. Proteins play many various functions in the human body:
   - They are the main building material for making cells and tissues.
   - They build hormones, enzymes and antibodies.
   - They help to regulate the proper osmotic pressure of the blood.
   - They help to repair and maintain the cells.
   - They are a secondary source of energy.

2. Essential amino acids are amino acids which cannot be built from scratch by the hu
   provided as a part of a healthy diet.

HIGH-PROTEIN DI

THE CHALLENGE OVERVIEW

Proteins are built from thousands of ami[illegible] bonded together into long chains. The[illegible] an indispensable part of a healthy, balanced [illegible]. The main sources of protein in a healthy, balanced [illegible] include meat, poultry and fish, eggs, mil[illegible] products, soy foods, Quorn™, and a range of [illegible] and pulses. Usually healthy people need about 1g of protein per kilogram body mass – but some may need more. High-protein diets are important for weightlifters and other sportspeople, teenagers, pregnant women and people suffering from certain diseases, such as some forms of cancer, or extensive burns.

A snack is [illegible] between m[illegible] several [illegible]

Your challenge is to make a protein-rich snack. Your task is to serve it [illegible] 100 kcal and 5g of protein.

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner and make notes in your books.

1. What are the functions of protein in the human body? (3.2.1.1)
2. What are essential amino acids? (3.2.1.1)

THE CHALLENGE: HIGH-PRO
– THE MUSCLE BUIL

YOUR TASK

Divide into groups of ... research foods which are high in protein, your recip... combine them with other ingredients and calcul... of your sn...

Your task is to prepare a protein-rich snack – and we mean it! Each ... at least 5g of protein. Also, each portion should provide no more th...

1. Foods rich in protein:

   .....

   .....

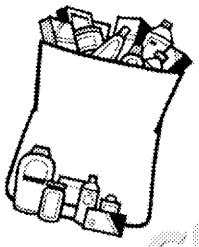
   .....

2. I choose to prepare a...
   - ❑ sweet snack
   - ❑ savoury snack.

3. I am going to pr...

   .....

   .....

INGREDIENTS	PROCED...	
❑ ❑ ❑ ❑ ❑ ❑ ❑ ❑ ❑ ❑		1 2 3 4 5 6 7 8 9 10

4. List the ingredients you are going to use and explain the procedure for prep

.....

.....

.....

.....

.....

5. Using a …e tool, calculate the nutritional value of your snack – both in a … planning the size of a portion, remember that it can't exceed 100 kcal and ha…

	In a batch	
Energy (kcal)		
Fat		
Saturates		
Carbohydrates		
Sugars		
Protein		
Fibre		

6. i) Or… the snacks are prepared, set up a simple tasting panel using a p…

	Savoury snack 1	Savoury snack 2	Savoury snack 3
Name of the snack / ingredients			
How many people favoured this snack over others?			

	Sweet snack 1	Swe…	Sweet snack 3
Name of the snack / ingre…			
…w …any …le favoured this snack over others?			

ii) Which snack do you like the most, and why? What is its energy and pro

.....

.....

.....

.....

.....

7. Imagine you are the manager of a fitness club. Do you think your clients snack? Why / why not?

.....

.....

.....

.....

.....

EVALUATION

Take some time to evaluate this challenge, noting down anything you would change next time.

.....

.....

.....

.....

Food choices – Physical

Teacher's guidance

What's covered in this session:

✓ Planning meals and [illegible] special [illegible] increased energ[illegible]e in sportspeople

Learning O[illegible]

Students should be able to:

❑ Explain how physical activity af[illegible]

❑ Plan balanced, varied, high-pro[illegible]

❑ Calculate energy needs of peop[illegible] sex and physical activity

Safety Tips

! Make sure that pupils with any kind of food allergy or intoleranc[illegible] participate in the activity.

Guidance for teaching:

➢ This is an open activity to help students develop their planning skills. Allow [illegible] work on the theoretical part of the project and 60 minutes to cook.

➢ Ask students to bring all the ingredients they are [illegible]n to use.

What you will need:

Equipment:	I[illegible]
Standard cooking equipment: saucepans, frying pans, oven, cooker, chopping boards, knives, spoons, etc.	Students should be ab[illegible] ingredients. You may [illegible] ingredients only, such [illegible]

ACTIVITY ANSWERS

1 i. Oliver's BMR is 2085 kcal.
ii. His TEE is 3545 kcal.
iii. Oliver needs around 147g of protein each day.
iv. This means that protein provides over 16% of his daily energy needs.

2.

	Carbohydrates	Fats
In grams	=3545 kcal*53.4%/4=505g	=3545 kcal*30%/9 kcal=118g
In %	100%-30%-16.6%=53.4%	30%
Total	=3545 kcal*53.4%=1893 kcal	=3545 kcal*30%=1064 kcal

3. Many athletes eat as many as 8–10 meals a day (including snacks). Any number of m acceptable.

Energy density of food can be increased for example by:
- using whole-fat products, e.g. whole milk, full-fat cheese
- adding vegetable oil to foods such as shakes, pâté or pasta

5. Ways of improving the nutritional value of foods (examples):
- to increase the amount of carbohydrates: use flour or breadcrumbs to coat a fo starch; add rice, pasta or potatoes to a dish; add bread to meat mince when m
- to increase the amount of protein: add egg to thicken soups or sauces; blend ch *pastes; add* cottage cheese to pastes and spreads
- to increase the amount of fats: add nuts or seeds to a food (either sprinkle on a tablespoon of olive oil to garnish a soup or salad; use oli e oil to coat vegetable carrots)
- to lower the amount of fats: modify co ng methods (e.g. choose dry-frying, st or baking), use low-fat varieti or foods (e.g. milk and dairy)
- it is unlikely that you need to limit the amount of carbohydrates or protein

8. There i ety o protein-rich products designed for sportspeople and people wh intake. mple, it is possible to adjust the physical state of whey protein for th Innovative products such as gels and shots can also provide high levels of nutrients i to overburden the stomach. Thanks to advanced processing methods, scientists are small amount of food, which helps to deliver a range of bite-sized, protein-rich snack

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. Examples could include:
- physical workers, such as builders
- teenage boys and men usually need more energy than women of the same ag differences in body composition

2.
- The formula for calculating BMR for women = (10*weight in kg)+(6.25*height i
- Using this equation, we can calculate that if Oliv a woman, his (her) BM less than if Oliver is a man).
- The difference usually comes fr th dy composition – women have less m fatty tissue requires le erg than muscles.

FOOD CHOICES: PHYSICAL

THE CHALLENGE OVERVIEW

Physical activity level is an important factor w[illegible] affects people's food c[illegible] sedentary lifestyle usually need signific[illegible] less energy than, say, professio[illegible] active a person is, the more en[illegible] he/she needs to function normally [illegible] Eating more calories tha[illegible] needed leads to weight gain (usually in fat tissu[illegible] eating fewer calo[illegible] needed results in weight loss (first adipose tissue[illegible] energy d[illegible] are used up, muscles are being broken down to obtain e[illegible]

Your challenge is to plan a daily diet for the athlete described below. Y[illegible] what his energy needs are! Your task is to prepare one dish from the me[illegible] is not only healthy, but also tasty.

Name: Oliver
Age: 20 years old
Weight: 98kg
Height: 1.92m
Profession: weightlifter (beginner)
Aim: muscle build-up
Physical activity level: 1.7

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. Who else, apart from sportspeople and professional athletes, can have high[illegible]
2. The formula for calculating BMR for women differs slightly from the one for [illegible] formula and indicate how the BMR would differ if Oliver was a woman. Wh[illegible] difference? (3.2.3.2)

THE CHALLENGE: FOOD & PHYSICAL ACTIVI

YOUR TASK

Divide into groups of fo[ur]. With each group, you will have to plan a plan for Oliver w[hich] should reflect his energy needs.

Remembe[r] that as a sportsman Oliver needs more protein than othe should provide 1.5g of protein per kg body mass. Fat shouldn't pro daily calorie intake.

1. i. Calculate Oliver's BMR using the equation below.

   BMR for men = (10 × weight in kg) + (6.25 × height in cm) – (5 × age in y

   Oliver's BMR = ...

   ii. Calculate Oliver's Total Energy Expenditure using his BMR and PAL.

   Oliver's TEE = ...

   iii. Oliver needs to provide ..... g of protein every day with diet.

   iv. This means that ..... % of energy in his diet will come from protei

2. Compl[ete] table to show the energy sources in Oliver's diet.

   Tip: 1g of carbs provides 3.75 kcal, 1g of protein provides 4 kcal and 1g of fa

	Carbohydrates	Fats
In grams		
In %		30%
Total kcal:		

3. Bearing in mind the values from the table above, try to design a daily food pl will you include? How are you going to increase the energy density without volume (after all, a stomach can only hold so much food!)?

.....

.....

.....

.....

4. Use an online tool to calculate the calorific value of your food plan. Remem
energy comes from!

	Time (when the meal should be eaten)	Carbohydrates	Fats	
1st meal				
2nd meal				
3r				
4th meal				
5th meal				
6th meal				
7th meal				
8th meal				
Total calorie intake from a source:				

5. Is this close to the values sh... table in point 2? If not, how can you

.....

.....

.....

.....

.....

.....

.....

6. Now pick one of the meals you planned and ...y ...ook it.

I chose to cook:

.....

.....

7. Once the food is cooked, assess your experience and its taste. Was it easy? correct? Maybe it should be smaller or larger? Would you be able to eat th flavour isn't acceptable?

8. Read this article on athletes' nutrition: **zzed.uk/7983-nutrition**.
Explain how innovation and development of technology can help sportspeo amount of nutrients in their diet.

EVALUATION

Take some time to evaluate this challenge, noti down anything y would potentially change next time.

Coronary Heart Dise

Teacher's guidance

What's covered in this session:

- ✓ Making shortcrust pastry
- ✓ Using a rolling pin
- ✓ Using the oven and a cooker
- ✓ How to set up a tasting panel

Learning Out

Students should be able to:

- ❑ understand the causes and mechan to include food-related factors and
- ❑ choose ingredients and cooking tech
- ❑ prepare varied, balanced meals suita
- ❑ modify and adapt recipes to improv effect on health

Safety Tips

! Make sure that students who are allergic to **wheat, milk** or **egg** intolerant, do not actively participate in the challenge (encour times and write notes, if possible).

! Remind students about the safety rules when handling high-risk they apply them to prevent cross-contamination of foods.

Guidance for teaching:

- ➢ Consider handing the worksheet to the students prior to the lesson so they they a g to cook and bring ingredients with them.
- ➢ Copy the student's worksheet accordingly to allow at least one pastry or filli

What you will need:

Equipment:	I
✓ Rolling pin	
✓ Shallow baking tins	
✓ Large bowls	
✓ Saucepans	There is a wide variety
✓ Baking paper	complete this activity.
✓ Baking beans	worksheet for guidance
✓ Ovens	r foods not includ
✓ Cooker	
✓ Kitchen scale	
✓ Measuring jugs	

ACTIVITY ANSWERS

Group 1 – pastry makers

1. In the recipe for pastry:
   - plain flour could be replaced with a wholemeal flour to increase the amount o
   - butter could be replaced with a vegetable fat spread (margarine) or even olive

2. Some words used to describe the pastry could inclu… ru… ly, dry, sticky, moist, butt

3.

Foods recomm… …let for CHD	Foods not recomm…
• rich … ly… …ed fats, especially omega-3 es… …atty acids, such as fish or linseed oil • low … …gar, e.g. fresh fruit and vegetables • high in dietary fibre, e.g. vegetables, wholemeal bread • prepared with the use of a low-fat method, e.g. steaming, boiling, simmering, poaching • low in sodium/salt • vegetable fat spreads and milk beverages enriched with phytosterols/phytostanols	• rich in saturated fats, … cuts, cream, butter • rich in sugar, e.g. swe… • deep-fried foods • low in dietary fibre • high in salt/sodium, e… meat and fish preserv…

Group 2 – the fillings

1. In the recipe for filling:
   - bacon should be replaced with a low-sodium, low-fat alternative product
   - whole milk and cheddar cheese could be replaced with low-fat alternatives, or
   - single cream can be replaced with either milk, plant milk or yoghurt

Group 3 – the controllers

2. Nutritional value of the original recipe:

	P… …atch (1325g)	P…
Energy	3485 kcal	
Tc…	250g	
Satu…	139g	
Carbohydrates	196g	
Sugars	15.8g	
Protein	128g	
Dietary fibre	9.4g	
Vitamin A	2944mcg	
Vitamin D	12.9mcg	
Vitamin E	9.3mg	
Vitamin K	16.6mcg	
Calcium	1850mg	
Iron	10.6mg	
Sodium	3930mg	

The percentage of RNI will differ depending on the se… …age group for which the

Group 1 and 2 – assembling

1. i. The baking temper… …e sh… …be between 160°C and 180°C (lower if a fa…
   ii./iii. The quiche s… …for around 20–30 minutes, depending on settings. …
   …gg… …and burning of the crust.

2. To calcu… …ns, students should sum up all the ingredients used and divide by 220 … obtained. It is possible that they will obtain less or more portions of quiche.
3. Ideally, the modified recipes should have less saturated fats, sodium and sugar, but … polyunsaturated fats than the original recipe.

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. Total fat consumption, saturated fats, trans fats, sugar

2.
   - The plaque forms when blood cholesterol level is high and the cholesterol bon
   - This forms insoluble compounds which attach to the blood vessels' walls.
   - The more plaque builds up in the vessel, the narrow vessel becomes, so
   - If the plaque builds up so much that it block bl d vessel totally, it prever to a heart attack (when there is no bl flo g to the organ, so it dies of 'hu pressure is so high that the es right before the clog).

3. The recipe isn't s anybody on a low-calorie diet, or for Muslims and Jews, who do t, and vegans, who do not eat any food of animal origin.

CORONARY HEART DIS

THE CHALLENGE OVERVIEW

Coronary heart disease is a condition in which bl[ood] v[essel]s in the heart become blocked by cholesterol plaque. Thi[s] br[eak]s blood from flowing freely and, as a result, can lead to a he[art] attack. Risk factors of the condition include sedentary lifestyle, stress, smoking, high-calorie diet, high consumption of saturated fats and sugars, obesity, high consumption of salt and hypertension. Studies have shown that increasing physical activity, dietary fibre and plant sterols consumption can help to lower the blood cholesterol levels and decrease the risk of a heart attack. Also, cooking methods play an important role, as they can significantly affect the nutritional value of the food.

Your challenge is to modify the recipe below to make it more suitable for a [person] and to cook it to see if it works!

Scenario:
Mary is a 50-year-old, overweight woman suffering from coronary heart disease and spends all day watching her favourite programmes on TV. She loves classic recipe is quiche Lorraine because of the lovely, buttery crust and rich filling. M[ary] healthy for her, but has no idea how to adjust the recipe to suit her needs more

INGREDIENTS

Shortcrust pastry:
- ❑ 225g [flour]
- ❑ 100g
- ❑ ¼ tsp salt

Filling:
- ❑ 6 rashers smoked bacon (app. 120g)
- ❑ 5 large **eggs**
- ❑ 150ml whole **milk**
- ❑ 140g Cheddar **cheese**
- ❑ ½ pint of single **cream**
- ❑ Nutmeg

Quiche Lorraine

Energy	Fat	Saturates	Total Sugar
2440kJ 585kcal	41g	23g	2.6
29%	59%	116%	3%

of an adult's Reference Intake
Typical values per 100g: Energy 1088kJ

Source:
- *https://www.bbcgoodfood.com/recipes/3075/quiche-lorraine*
- *https://www.bbcgoodfood.com/recipes/2983/basic-shortcrust-pastry*

QUESTIONS TO THINK ABOUT

Discuss these questions with a partner or make notes in your books.
1. What [nutrients] need to be cut down in a diet for CHD? (3.2.3.4)
2. How do cholesterol plaque form in the blood vessels? Why is it dangerous?
3. What other groups of people is this recipe unsuitable for? (3.2.3.1, 3.2.3.4, 3.5.1.2)

THE CHALLENGE: CHD – HEART OF HEALT

YOUR TASK

Divide into three [illegible]. **Group one** will experiment with the pastry experime[illegible]h [illegible]e filling. At the end you will combine the ingredi[illegible] to check [illegible]y work together.

Group three (the controllers) will prepare the quiche using the recip[illegible] Begin by recalling what the dietary requirements for coronary hear[illegible] you substituted all risky ingredients and helped Mary get a healthy [illegible]

Group 1 – pastry makers

- Basic shortcrust pastry is made of flour and butter with a pinch of salt. Are p[illegible] person suffering from CHD? Think of the ways to substitute them and make [illegible] will be just as tasty and crumbly. Divide into a couple of subgroups to exper[illegible] Don't forget to note your recipes down!
- Remember that your dough should be as close as possibl[illegible] to the original on[illegible] mouthfeel and taste.
- This task shouldn't take you long – i[illegible] eantime, try to complete the tabl[illegible] foods which are recommend[illegible] foods which should be limited in a diet f[illegible] done, share your fi[illegible] with your colleagues from group 2!

1. Begin b[illegible]ribing how you are going to modify the recipe for a classic quic[illegible] suitable for Mary.

Type of fat used: .....

Type of flour used: .....

Other ingredients: .....

	Procedure
1	
2	
3	
4	
5	
6	
7	
8	

2. Describe your dough before and after baking by completing the spider diagr descriptive words as you can.

3. Identify foods recommended and not recommended in a diet for CHD.

Recommended	
Not recommended	

Group 2 – the fillings

There is no quiche without a filling (or a feeling). The basic recipe for quiche Lor
which – let's be honest – should be limited in a healthy, balanced diet. Think of t
could substitute them to make the quiche more suitable for Mary. After all, heal
boring, right? Maybe you can think of some ingredients which could improve the
Or maybe there is something you could add to lower Mary's blood pressure and b
Divide into a couple of subgroups to experiment with var ngredients and ide
recipes down!

Remember that your filling sho be as close as possible to the original one in te
and taste.

1. Begin b g the ingredients you are going to use and writing the procedu

   Ingredient list:

   .....

   .....

   .....

   .....

   .....

   .....

	Procedure
1	
2	
3	
4	
5	
6	
7	
8	

2. Explain why you chose the ingredients and cooking methods shown above:

   .....

   .....

   .....

   .....

   .....

   .....

Group 3 – the controllers

Your task is to prepare the quiche Lorraine using the recipe on the overview page
Make sure you do this as accurately as possible as your quiche will be the point o
prepared in class.

You also need to calculate the full nutritional value of the recipe and prepare a la

1. Prepare the quiche Lorraine using the recipe on the overview page.
2. Calculate the nutritional value of the recipe, either for a batch or a portion (
make six portions). Use the calculator at **http://explorefood.foodafactoflife**

Nutrition facts	
Serving size: 225g	
Calories	
Total fat	
Saturates	
Carbohydrates	
Sugars	
Protein	
Fibre	
Amount	**% of RNI**
Vitamin A	
Vitamin D	
Vitamin E	
Vitamin K	
Calcium	
Iron	
Sodium	

Groups 1 and 2 – assembling

Now it's time to combine the components. Match up with your classmates to a

1. i. What is the baking temperature? .....

   ii. How long do you think the quiche will bake for? .....

   iii. How long did the quiche really bake for? .....

2. While the quiche is baking, try to do some maths…

   The original recipe is enough to prepare six portions of quiche (1325g per ba
   How many portions of quiche did you obtain?

   .....

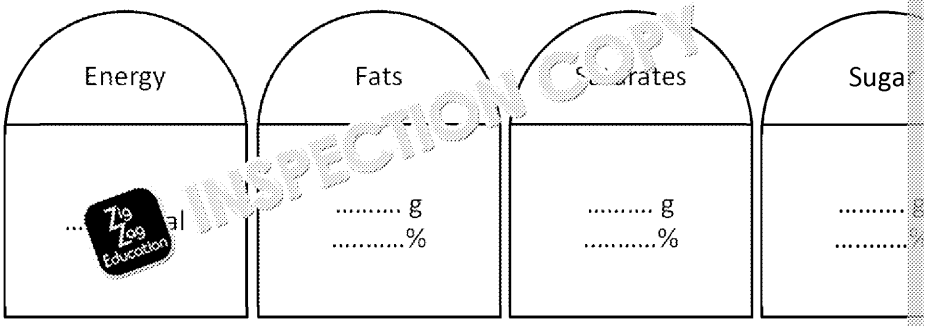
   .....

   .....

   .....

3. Then calculate the nutritional value of your recipe using an online calculator (**http://explorefood.foodafactoflife.org.uk/**) and colour-code the label belo

   Did you succeed? Is your recipe better than the original quiche Lorraine? If time to make it even better for Mary?



   PSSST! Use this guide to help you with the colouring: **zzed.uk/7983-colours**

4. Set up a simple tasting panel to compare all the quiches made in class. Rem possible – you are supposed to assess the new recipes against the original o record your findings.

   Use a 1 to 5 scale using the key below.

1	2	3	
unacceptable	poor	moderate	very

	Quiche L[illegible]	Version 1	V
Appearance			
Colour			
[illegible]			
Tex[illegible] the pastry			
Text[illegible] of the filling			
Overall palatability			
Nutritional value			
Other:			
Other:			
Total:			

EVALUATION

Take some time to evaluate this challenge, noting down anything y would potentially change next time.

.....

.....

.....

.....

Type 2 diabetes

Teacher's guidance

What's covered in this session:

- ✓ Planning meals and [illegible] specific [illegible] (type 2 diabe[illegible]

Learning O[illegible]

Students should be able to:

- ❑ understand the mechanisms a[illegible]
- ❑ understand the importance of [illegible]
- ❑ plan balanced diets suitable for [illegible]
- ❑ modify recipes and amend por[illegible] sugar consumption

Safety Tips

! Make sure that students who are allergic to any food products [illegible] in the challenge (encourage them to measure times and write [illegible]

! Remind students about the safety rules when handling high-risk [illegible] they apply them to prevent cross-contamination.

Guidance for teaching:

- ➢ This is an open activity to hel[illegible] develop their planning skills. Allow [illegible] work on the theoret[illegible] the project and two hours to prepare the foo[illegible]
- ➢ Ask stu[illegible] to [illegible] all the ingredients they are planning to use.

What you will need:

Equipment:	I[illegible]
✓ Oven and cooker ✓ Baking tins ✓ Saucepans ✓ Bowls ✓ Chopping boards ✓ Knives ✓ Whisks, hand mixers and food processors	Students should be ab[illegible] ingredients. You may [illegible] ingredients only, such [illegible]

Activity Answers

1. Dietary recommendations for obesity and type 2 diabetes are usually similar, since t
together (or, to be more precise, type 2 diabetes is induced by obesity). The main g
to improve the function of insulin (either by relieving the pancreas or improving tiss

When planning such a diet, it is important to:

- ✓ calculate calorific value of the diet – usually ... s e ... al to TEE (Total Energy E
gradual weight loss over a longer p... f t...
- ✓ include sources of healthy f... ... eat the heart
- ✓ limit consumption ... ugars, possibly to less than 5% of daily calorie co
- ✓ eat re...lar ... revent cravings and increase in blood sugar levels – usua
th... ck... the last one is eaten right before going to sleep to prevent bloo
- ✓ co... arge amounts of dietary fibre to support weight loss, and improve b
- ✓ encourage the patient to do moderate physical activity, such as daily walks, cy
- ✓ control alcohol consumption. While beer may stimulate appetite and increase
its heart-protective features. One glass of red wine every two to three days m

2. **Exemplary daily meal plan for an obese person suffering from type 2 diabetes:**
   - **Breakfast:** two slices of wholemeal bread with vegetable fat spread, two slices
salad, unsweetened tea
   - **Snack:** lettuce rolls with cream cheese, cucumber and smoked salmon, apple, w
   - **Lunch:** leek and potato cream soup with yoghurt, buckwheat groats, chicken g
pepper, water
   - **Snack:** brown rice cakes with hummus, vegetable sticks (e.g. carrots, cucumbe
   - **Dinner:** spaghetti with mushroom Bolognese, spinach and watercress salad wi
glass of red wine
   - **Snack:** one slice of wholemeal bread with cream ... nd roasted pumpkin s

'Questions to think about' answers:

1. Exampl... de
   - ca... ular disease (e.g. coronary heart disease, atherosclerosis, hypertens
   - depression
   - arthritis
   - certain types of cancer (e.g. bowel and breast cancer)

2. - Intrinsic sugars occur naturally in food products, e.g. lactose in milk, fructose i
   - Free sugars are added to food products, e.g. sucrose to beverages and yoghur

TYPE 2 DIABETE

THE CHALLENGE OVERVIEW

Type 2 diabetes is a disease which develops as a result of pancreatic dysfunction. The pancreas is an internal organ which produces an important hormone - insulin. But sometimes there is too little insulin or the insulin is produced abnormally, and cannot carry out its function properly. In effect, blood sugar levels rise and begin to damage the nerve cells and other tissues around the body. For this reason, people with type 2 diabetes need to control their blood sugar level regularly, control their carbohydrate consumption and sometimes take medication.

There

livin

Your challenge is to plan a daily diet, which consists of three main mea
diabetic described below. You have to take into consideration the tips be
are suitable for your patient. Then you will need to cook one of your p
recipe works – remember that it not only has to be healthy

Tom is a 60-year-old man suffering from obesity and type 2 diabetes. His TE
You have to plan a breakfast, lunch and dinner and two snacks in between.

The energy in your diet should come 55% from carbohydrates, 30% from fat
Sugars should provide less than 5% of daily energy consumption. You can ca
tool at **http://explorefood.foodstandards.org.uk/**

Remember that all the meals should be evenly distributed throughout the
provide around 25% of TEE, while snacks should only provide up to 20%

The diet should provide 35g of dietary fibre – fibre slows down sugar absorp
sugar levels even throughout the day.

You have to limit the amount of free sugars in the diet. Only natural source

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. Obesity is a risk factor for developing type 2 diabetes. The risk of what othe
   obesity? (3.2.3.4)
2. What is the difference between intrinsic sugars and free sugars? Provide a s

The Challenge: Type 2 – Sweet and Sou

Your Task

Imagine that you're working as a dietitian in a hospital. Your task is t diabetic man.

Work in p plan the diet and calculate its nutritional value. The main mea (breakfast, lunch or dinner) and cook it to see if your id also tasty and would be acceptable for the patients.

1. There are some tips on the overview page you have to follow. What else do when planning a diet for a man such as Tom?

.....

.....

.....

.....

2. With a partner, plan the daily di in the online calculator to see how you necessary to change th dients or their amounts due to dietary restrict

Once y ve al dietary plan, describe your meals below. Make sur cookin ods used, as well as the size of a portion.

Breakfast:

.....

.....

.....

Snack 1:

.....

.....

.....

Lunch:

.....

.....

.....

Snack 2:

.....

.....

.....

Dinner:

.....

.....

.....

Snack 3:

.....

.....

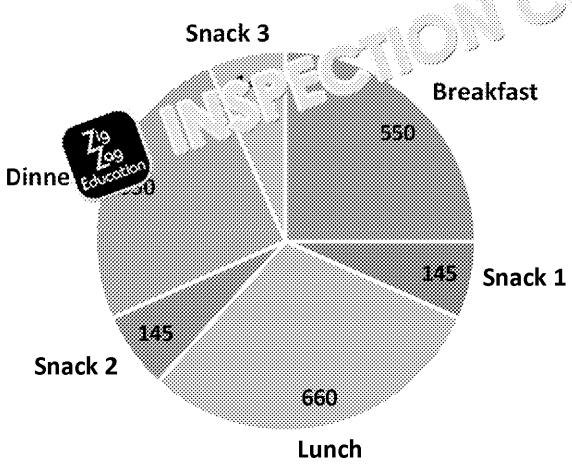
.....

3. Using an online tool, calculate the nutritional value of your diet. Record the

	Energy from carbohydrates (in kcal)	Energy from fat (in kcal)	Energy from proteins (in kcal)	Energy from sugars (in kcal)
Breakfast				
Snack				
Lunch				
Snack 2				
Dinner				
Snack 3				
Total				

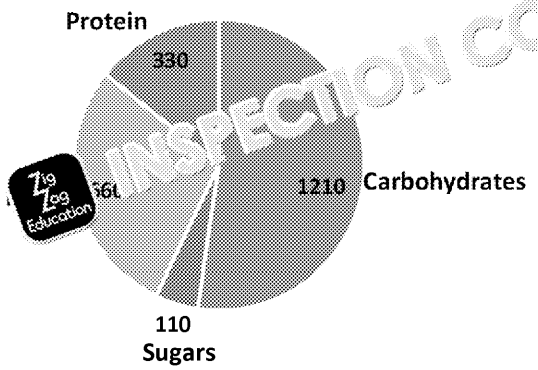
4. An ideal diet should provide 1210 kcal from carbohydrates (maximum 110 k
fats and 330 kcal from proteins. The ideal diet would provide 550 kcal with
550 kcal with dinner and 145 kcal with each snack. Draw pie charts to illustr
reflects these recommendations.

Energy distribution with different meals throughout the day, in kcal



How many kc
ea

Energy provided with various sources in kcal



How many kcal is
macr

5. After you have planned your meals, it's time to cook! Choose which meal y

- ❑ Breakfast
- ❑ Lunch
- ❑ Dinner

6. Once made, divide it into portions of the size you planned before. Set up a p
dish. Ask your classmates to use a 1 to 5 scale to subjectively assess the foo
judge whether the dish is tasty, good looking (appetising and appealing) and
sufficient (not too large and not too small).

Extra tip: When assessing the portion size, ask yourself whether you would b
food, or you would rather need more/less?

1	2	3	
unacceptable	po	moderate	g

	Texture	Appearance	Tas
Person 1			
Person 2			
Person 3			
Person 4			
Person 5			
Person 6			
Person 7			
Person 8			
Person 9			
Person 10			
Total score:			

7. Which eristic of your dish scored the most?

.....

.....

8. What could you do to improve the dish and make it more acceptable for the
healthy?

.....

.....

.....

.....

.....

.....

9. Is the portion size correct? Maybe it should be smaller or larger – after all, y
but you also want to limit the food waste!

.....

.....

.....

.....

.....

EVALUATION

**Take some time to evaluate this challenge, noting down anything y
would potentially change next time.**

.....

.....

.....

.....

HIGH FIBRE DIETS

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

- ✓ Planning meals and [illegible] for sp[illegible] di[illegible] groups – sch[illegible] children, high-f[illegible] diet

LEARNING OUT[illegible]

[illegible]s should be able to:

- ❑ understand the function of dietary fib[illegible]
- ❑ identify groups of consumers who mig[illegible]
- ❑ modify recipes to increase fibre cons[illegible]
- ❑ choose ingredients and cooking meth[illegible] rich in fibre dishes
- ❑ understand the importance of water [illegible]

SAFETY TIPS

! Make sure that pupils with an allergy to **wheat**, **sesame**, **tree nut**[illegible] **milk**, or with gluten intolerance, do not actively participate in th[illegible]

! Pay extra attention when performing the taste panel, as some [illegible] have a food allergy. Ideally, ensure that no allergenic ingredie[illegible] recipes or label foods clearly so that those who are allergic to [illegible]

GUIDANCE FOR TEACHING:

- ➢ This is a fairly ope[illegible]ity, which requires students to interact with other st[illegible] you ha[illegible] pe[illegible]ission of the head teacher and/or other teachers to inter[illegible] OR peri[illegible]e tasting panel during a break.
- ➢ Copy the students' worksheet page for the taste panel accordingly so that th[illegible] carry out the tasting.

WHAT YOU WILL NEED:

Equipment:	I[illegible]
✓ Oven and cooker ✓ Baking tins ✓ Saucepans ✓ Bowls ✓ Chopping boards ✓ Knives ✓ Food processors, hand mixers and [illegible]	There is a wide variety [illegible] complete this activity. [illegible] wo[illegible]ksheet for guidanc[illegible] [illegible]th[illegible]r foods not includ[illegible]

ACTIVITY ANSWERS

2.

Sources of soluble fibre	Sources
• Oats • Lentils • Beans • Fruit	• Bran • Cereals • Dried fruit • Corn

5. To include more fibre in the diet, consider:
   - ✓ using wholemeal flour instead of plain flour when making bread, cakes, pancakes
   - ✓ using wholemeal breadcrumbs instead of breadcrumbs to coat fish fingers or fish cakes, or to top pies
   - ✓ using wholemeal bread, pasta and rice instead of white
   - ✓ eating potatoes together with the skin, e.g. in jacket potatoes, potato salad
   - ✓ adding fresh and dried fruit to desserts and savoury dishes such as couscous
   - ✓ eating dried and fresh fruit as a snack
   - ✓ adding a salad to each meal or sandwich
   - ✓ adding lentils, beans or chickpeas to curries, stews and soups
   - ✓ using hummus (blended chickpeas paste) instead of butter for sandwiches

8/9. Students should notice that, however challenging, high-fibre meals can also be tasty and appealing to picky consumers. Ideally, students should develop some tricks to include high-fibre ingredients without consumers spotting the difference (e.g. adding some mashed parsnip or celeriac to a recipe will increase the amount of fibre, while the taste and colour change will be negligible).

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. The health benefits of fibre include:
   - Insoluble fibre:
     - bulks up in the stomach, giving the feeling of satiety for longer
     - helps to regulate bowel movements and excrete the food waste from the body
     - helps to prevent constipation
   - Soluble fibre:
     - helps to slow down sugar absorption
     - lowers blood cholesterol and sugar levels

2. **Examples may include:** *obesity, bowel cancer, type 2 diabetes, high blood cholesterol, irritable bowel syndrome, diverticulitis, constipation, diarrhoea*

3. - Water causes the fibre to swell and bulk up, thanks to which it prompts bowel movements and excretes food waste from the body.
   - Bulking also provides feeling of satiety for longer.
   - Drinking too little water while eating a high-fibre diet could lead to constipation.

HIGH-FIBRE DIET

THE CHALLENGE OVERVIEW

Dietary fibre is a group of indigestible [illegible] found in plant cell walls. Although fibre doesn't [illegible] energy, it is an important part of a healthy diet. It can be [illegible] into soluble and insoluble fibre – each of these [illegible] different health benefits. Dietary fibre occurs in plant foods only, and there is much more of it in unprocessed, unrefined products. For example, a raw apple with the skin will provide much more fibre than apple juice or cooked apple puree.

Your challenge is to design and make a fibre-rich savoury dish which will b children. Once your dish is done, you will need to walk around the scho tasting panel among your younger schoolmates so make sure the dish is n and attractive.

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes [illegible] ar books.

1. What are the health benefits of eating so[illegible] dietary fibre and insoluble die
2. Name at least three conditions [illegible] for which a high-fibre diet can be
3. Explain why drinking th[illegible] amount of water is very important when eati

THE CHALLENGE: HIGH-FI
– COTTONED ON

YOUR TASK

Divide into small groups – each group you will have to:

1. choose one f[illegible]oduct from each category below.
2. desig[illegible] high fibre savoury meal using these four products, plus such [illegible]**gs**, oil or **butter**, spices and herbs
3. cook that meal
4. conduct a preference tasting panel among other students in y[illegible] meal is acceptable for children and teenagers

1. To complete your task you will have to use **ONE** food from each category be[illegible] choose in each section.

Category A (a portion of 50g raw)	Category C
❑ Brown rice	❑ **Sesame seeds**
❑ White rice	❑ **Walnuts**
❑ **Wholemeal pasta**	❑ **Almonds**
❑ **Wholemeal bread**	❑ Pumpkin seeds
❑ Potatoes	❑ **Breadcrumbs**
❑ **Oatmeal**	❑ **Peanuts**
Categor[illegible]p[illegible]tion of 50g raw)	**Category D**
❑ B[illegible]	❑ Carrot
❑ **Fis[illegible]**	❑ Courgette
❑ Green beans	❑ Cucumber
❑ Red lentils	❑ Onion
❑ Chickpeas	❑ Broccoli
❑ Chicken	❑ Sweetcorn

… and these additional ingredients:

1. ……

2. ……

3. ……

4. ……

2. Which of the products indicated on the previous page are high in fibre?

.....

.....

3. My high-fibre meal is called:

.....

.....

4. Use an online calculator or food tables to calculate the nutritional value of y
the next page. Compare it with the other dishes cooked in class to see who

Nutrition facts	
Portion size: .....g	
Calories	
Total fat	
Inc. saturates	
Carbohydrates	
Inc. sugars	
Protein	
Fibre	
A...un	**% of RNI**
V...n A	
Vitamin D	
Vitamin E	
Vitamin K	
Calcium	
Iron	
Sodium	
Cholesterol	

5. Compare the nutritional value of your dish with other dishes in the class. Is y
how could you increase the amount of fibre in it?

.....

.....

.....

.....

6. Once your dish is cooked, divide it into small portions and conduct a prefere students in your school. Use the template to record their answers.

How do you like the appearance of this dish?	❑	❑	
How do you like the smell of this dish?	❑	❑	
How do you like the taste of this dish?	❑	❑	
Would you like to eat this dish more often?	❑	❑	

How do you like the appearance of this dish?	❑	❑	
How do you like the smell of this dish?	❑	❑	
How do you like the taste of this dish?	❑	❑	
Would you like to eat this dish more often?	❑	❑	

How do you like the appearance of this dish?	❑	❑	
How do you like the smell of this dish?	❑	❑	
How do you like the taste of this dish?	❑	❑	
Would you like to eat this dish more often?	❑	❑	

7. Now sum up all the sad, indifferent, cheerful and happy faces in each catego

How do you like the appearance of this dish?			
How do you like the smell of this dish?			
How do you like the taste of this dish?			
Would you like to eat this dish more often?			

8. Which category got the best reviews? What can you do in the future to imp categories?

.....

.....

.....

.....

.....

9. Is it easy to cook a healthy, high-fibre dish which would be attractive for sch

.....

.....

.....

.....

.....

EVALUATION

Take some time to evaluate this challenge, noting down anything y would p[illegible] change next time.

.....

.....

.....

.....

LOW-SUGAR DIET

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

- ✓ Modifying recipes for [illegible] dietary needs: [illegible]ar diet, type 2 [illegible]es, tooth decay, obesity
- ✓ Using the oven
- ✓ Raising methods

LEARNING OU

Students should be able to:

- ❑ explain the role of sugar in the f[illegible] obesity and type 2 diabetes
- ❑ understand the importance of g[illegible]
- ❑ modify recipes and choose ingre[illegible] consumption while maintaining [illegible] the dish

SAFETY TIPS

! Make sure that students who are allergic to **wheat**, **milk** or **eggs**, [illegible] intolerant, do not actively participate in the challenge.

! Ensure students handle hot foods/dishes with care.

WHAT YOU WILL NEED:

Equipment:	I[illegible]
✓ 4 baking tins of the same si[illegible]	There is a wide variety [illegible] complete this activity.
✓ Food processors or h[illegible]	worksheet for guidanc[illegible]
✓ Large b[illegible]ls	other foods not includ[illegible]
✓ Over[illegible]	

ACTIVITY ANSWERS

1. Functions of sugar in the cake include:
   - adding bulk
   - improving texture through aeration
   - providing sweet taste
   - improving the colour through caramelisation

3. Some substitutes may not be as efficient in providing those functions. For example
   - stevia will not add bulk as only a small amount is used
   - honey and agave syrup produce less bulk
   - xylitol, stevia and isomalt do not caramelise, and, therefore, will produce a dif
   - liquid sweeteners (honey, agave syrup) will not aerate as well as crystalline suga

4. To compensate for those changes, one might consider adding more flour to the bat to add volume and improve the texture, sifting flour through a fine sieve to add mo

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. - Sugar is made either of sugar cane or sugar beet.
   - Production process for both of them is similar and includes the main steps suc
     - planting and harvesting;
     - preparation and processing, during which the plants are washed and cut;
     - juice extraction pressing during which the sugary syrup is pressed out of
     - purification of juice by clarification and evaporation of water;
     - crystallisation to obtain sugar crystals from the syrup;
     - centrifuging to separate molasses from sugar crysta;
     - drying and packaging.

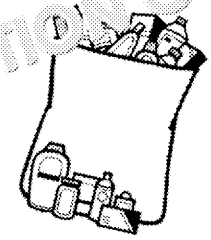
2. - Sugar is the food for bacteria living in the mouth.
   - While the bacteria thrive on sugar, they produce acids.
   - The acids dissolve tooth enamel, which is then more susceptible to further

LOW-SUGAR DIET

THE CHALLENGE OVERVIEW

Glucose is the primary source of energy in the human body. As a simple sugar, it is a part of many carbohydrates, such as table sugar (sucrose), milk sugar (lactose) and malt sugar (maltose). Sugars can be divided into intrinsic sugars – those which occur naturally in vegetables and milk – and free sugars. Free sugars include sugars naturally occurring in honey and fruit juices, and sugars which are added to food products during production. Excess consumption of free sugars is linked to the increased risk of overweight, obesity, type 2 diabetes and dental caries. Such link has not been proven for intrinsic sugars.

Your challenge is to make a sponge cake using a sugar substitute. Your task so that you obtain both the sweet taste and the open texture of the cake healthier!

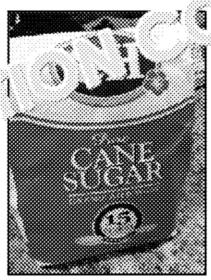
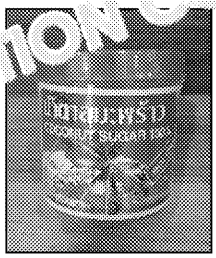
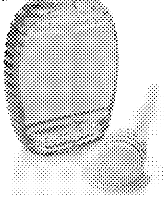
INGREDIENTS		PROCEDURE	
Sponge cake (basic): ❑ 115g self-raising **flour** ❑ 115g **butter** ❑ 115g caster sugar ❑ 2 large eggs ❑ 1 tsp vanilla extract ***Source:*** • *http://www.deliaonline.com/recipes/type-of-dish/cake-recipes/classic-sponge-cake*		**1**	Preheat the oven t
		2	In a food processo with sugar until p
		3	Beat in the eggs a
		4	Sift in the flour an
		5	Pour the batter in with baking paper
		6	Bake for around 2 **Make sure that t the same for all c

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. Research the process of sugar production. What plants is sugar made from?
2. Explain the role of sugar in the development of dental caries. (3.2.3.4)

THE FACT SHEET

Table sugar ✓ white crystals built of one molecule of glucose and one molecule of fructose ✓ excess consumption contributes to overweight, obesity, cardiovascular diseases, type 2 diabetes, tooth decay ✓ used in recipes as a sweetener, bulking agent, preservative, stabiliser or colourant [illegible] improve [illegible] ✓ 394 kcal / 100g 	S ✓ artificial sweetener times sweeter than ✓ safe for consumptio calorie diets, and ch tooth decay) ✓ heat stable, can be u for cooking and bak instead of table sug 1:1 ratio ✓ Not broken down by body, so 0 kcal / 10
Stevia ✓ extract of steviol glycosides naturally occurring in *Stevia rebaudiana* plant, up to 150 times sweeter than table sugar ✓ safe for consumption by diabetics, people on low-calorie diets, and children (doesn't contribute to tooth decay) ✓ heat stable, can be used for cooking and baking instead of sugar in 1:8 ratio (1 tsp of stevia = 8 tsp of sugar) ✓ 0 kcal / 100g 	✓ white powder extra ✓ helps to reduce de chewing gums and t and children ✓ heat stable, can be u cooking and baking of table sugar in 1:1 ✓ 243 kcal / 100g
Coconut sugar ✓ type of sugar produced from the sap of coconut palm tree flower buds ✓ available [illegible] powder, or in a [illegible] ✓ has a lower glycaemic index than table sugar and contains some inulin (a type of dietary fibre), so may be consumed in moderate amounts by diabetics ✓ used in recipes to replace sugar in 1:1 ratio ✓ 394 kcal / 100g 	B ✓ unrefined, soft brow fructose, with arou ✓ due to molasses, co potassium and mag ✓ used in recipes to r sugar in 1:1 ratio ✓ excess consumptio contributes to over obesity, cardiovasc diseases, type 2 dia tooth decay ✓ 373 kcal / 100g
Honey ✓ sweet substance produced from flower nectar, ranging in colour and texture from thick and white to dark brown and liquid ✓ contains fructose, glucose, maltose, sucrose and other sugars, as well as some amount of minerals and enzymes ✓ may cause allergic reactions, unsuitable for diabetics ✓ used instead of [illegible] recipes in 3:4 ratio ([illegible] of honey = 4 spoons of suga[illegible]itable for recipes which require creaming ✓ 304 kcal / 100g 	A ✓ sweet liquid obtain and less viscous tha ✓ consists mainly of f small amount of glu 1.5 times sweeter t 2:3 ratio (2 spoons ✓ has a low glycaemic which makes it mor suitable for diabetic honey or sugar itsel the high amount of increases the risk o and diet-related dis ✓ 310 kcal / 100g

THE CHALLENGE: LOW-SUGAR
TO EAT A CAKE, AND HAVI

YOUR TASK

Divide into four group[illegible] will prepare the cake following th
important [illegible] to compare all the cakes at the end of
which su[illegible]ute is best for baking.

Groups 2, 3 and 4 will use sugar substitutes (choose from the fact sh
modify the basic sponge recipe so that your cake is as similar as po
taste to the basic sponge cake.

1. Sugar plays many different functions in a sponge cake batter. What are the

2. Mark which group you ar

- ❑ Gr
- ❑ G
- ❑ Gr
- ❑ Group 4

3. Read the fact sheet about the sugar substitute you are going to use. Formu
effective it will be in replacing sugar in the recipe for a sponge cake.

4. If you think that your subst[illegible] may not provide all of the functions that su
any other ingredie[illegible] you might add which could help with that? Justi

5. Now it's time to make and bake! While your cake sits in the oven, try to cal
can use an online tool or food tables.

	Classic sponge cake	Group 1	Gr
Energy (kcal)			
Fats (g)			
Saturated (g)			
Carbohydrates (g)			
Sug (g)			
P (g)			
Fibre (g)			

6. The World Health Organization states that in a healthy, balanced diet, no m
intake should come from sugar (and no more than 5% from free sugar). How
you could eat each day if you wanted to follow the guideline?

To answer this question, first you need to calculate how much energy you n

BMR boys=(10 × weight in kg)+(6.25 × height in cm)–(5 ×
BMR girls=(10 × weight in kg)+(6.25 × height in cm)–(5 × a

My BMR = ...

Total Energy Expenditure depends also on your physi ctivity. So... how a
Not active -> multiply your BMR b TEE = BMR × PAL
Moderately active -> multiply you by
Very active -> mult MR by 1.8
My TEE =

Now t know how many calories you need every day, you can count h
sugar.

My TEE × 10% = ... **=** ..... **kcal from sugar =** .....

Finally, you are able to calculate how big a portion provides your 10% dail

7. Once the cakes are baked, it's time to compare them! Set up a simple tastin
this test, you will have to order all the cakes in a rank order (given in the tab
characteristics.

	The worst	So-so	Goo
Appearance			
Lightness			
Moistness			
T			
Sweetness			
Colour			

8. Which was sponge classified most often as the best? Which one was most o

.....

.....

9. Choose which sugar substitute is best for baking ... y our choice.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

EVALUATION

Take son ... e to evaluate this challenge, noting down anything y would potentially change next time.

.....

.....

.....

.....

LOSE-WEIGHT DIET

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

- ✓ Planning meals and [illegible] for sp[illegible] die[illegible] grou[illegible]sity

LEARNING OUT[illegible]

[illegible] should be able to:

- ❑ identify and explain various causes of [illegible]
- ❑ explain why obesity is a major public h[illegible]
- ❑ plan a balanced food plan for a longer [illegible] given set of guidelines and aimed at a [illegible]
- ❑ plan a low-calorie, low-fat diet
- ❑ choose ingredients and cooking metho[illegible] tasty meals

GUIDANCE FOR TEACHING:

- ➢ Allow students at least two weeks to prepare the project.

EXTEND LEARNING:

+ Find the current dietary guidelines at **https:/ w[illegible].v.uk/government/pu[illegible]**

WHAT YOU WIL[illegible]

Equipment:	I[illegible]
✓ No cooking equipment needed ✓ Computers / online tools for planning diets / food tables if you are planning to conduct part of the activity in class	No ingredients needed

ACTIVITY ANSWERS

1. Margaret's BMI = 77kg/(1.62)^2 = 29.34kg/m^2
   David's BMI = 102kg/(1.82)^2 = 30.79kg/m^2

3. i. **Margaret's BMR** = 1421 kcal; her PAL is moderate, since she has a little physic
   ii. **Margaret's TEE** = 2273 kcal
   iii. the calorie intake for Margaret should be 17[illegible] al
   i. **David's BMR** = 1987 kcal; his PAL i[illegible]w, [illegible]ce he is not physically active a
   ii. **David's TEE** = 2781 kcal
   iii. the calorie intake fo[illegible] s[illegible]ould be 2281 kcal

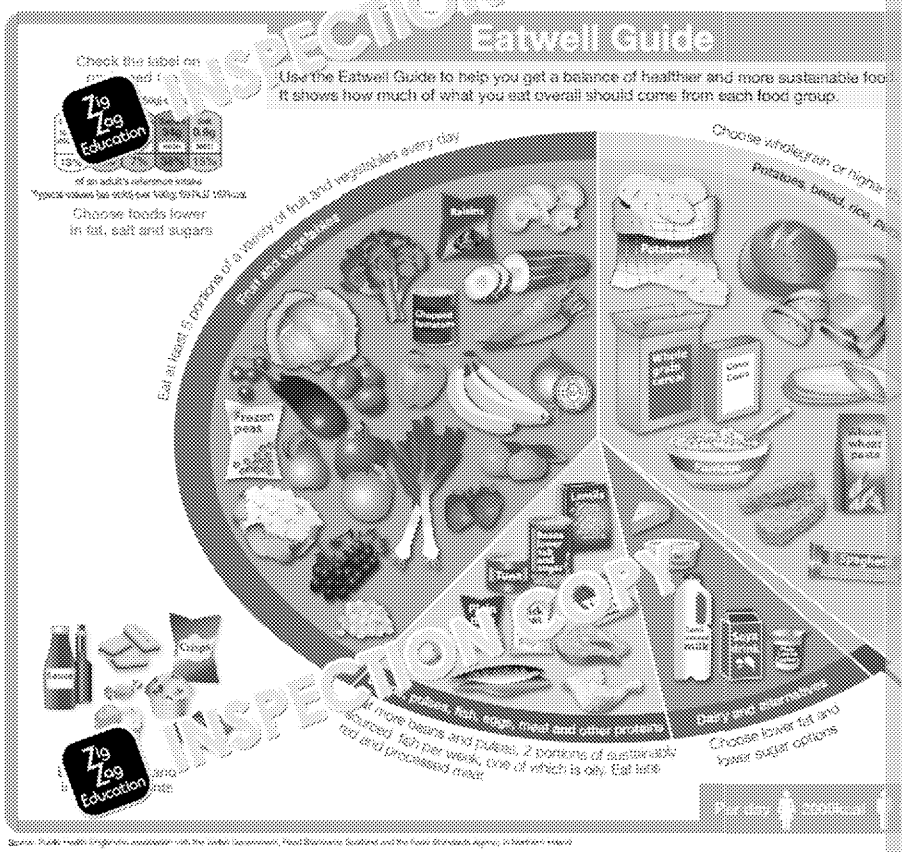
4.

Ma[illegible]	Protein	Fats	Carbohydra
%	15%	35%	45%
kcal	265 kcal	607 kcal	798 kcal

David	Protein	Fats	Carbohydra
%	15%	35%	45%
kcal	343 kcal	798 kcal	1026 kca

5.
   - Margaret may think about increasing her iron intake since she is of childbearin
     vitamin E intake to slow down ageing processes.
   - David can increase dietary fibre intake since men are at a higher risk of develo
   - Both of them should also limit their sodium intake.

6.



7. Dietary recommendations for obesity and type 2 diabetes are usually similar, since t
together (or, to be more precise, type 2 diabetes is induced by obesity). The main g
to improve the function of insulin (either by relieving the pancreas or improving tiss
planning such a diet, it is important to:
   - ✓ calculate calorific value of the diet – usually this is equal to TEE (Total Energy E
gradual weight loss over a longer period of time
   - ✓ include sources of healthy fats to protect the heart
   - ✓ limit consumption of simple sugars, possibly to le[illegible]n % of daily calorie co
   - ✓ eat regular meals to prevent cravings and ir[illegible]rea[illegible]blood sugar levels – usua
three snacks – the last one is eate[illegible]efore going to sleep to prevent bloo
   - ✓ eonsume large amounts o[illegible]ie a[illegible]re to support weight loss, and improve b
   - ✓ encourage the p[illegible]moderate physical activity, such as daily walks, cy
   - ✓ co[illegible]lcoumption. While beer may stimulate appetite and increase
its [illegible]rotective features. One glass of red wine every two to three days m

Exemplary daily meal plan for an obese person suffering from type 2 diabetes:

- Breakfast: two slices of wholemeal bread with vegetable fat spread, two slices
salad, unsweetened tea
- Snack: lettuce rolls with cream cheese, cucumber and smoked salmon, apple, w
- Lunch: leek and potato cream soup with yoghurt, buckwheat groats, chicken g
pepper, water
- Snack: brown rice cakes with hummus, vegetable sticks (e.g. carrots, cucumbe
- Dinner: spaghetti with mushroom Bolognese, spinach and watercress salad wi
glass of red wine
- Snack: one slice of wholemeal bread with cream cheese and roasted pumpkin s

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. BMR depends on weight, height, age and sex of a per[illegible]or

2. Examples could include:
   - Steaming
   - Br[illegible]
   - Bl[illegible]
   - Poaching
   - Baking
   - Roasting
   - Grilling
   - Dry-frying
   - Stir-frying

LOSE-WEIGHT DIE

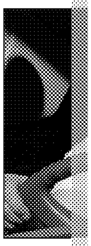
THE CHALLENGE OVERVIEW

Fat is an important macronutrient which plays many various roles in the human body – it provides energy, helps to build cell membranes and hormones, dissolves vitamins, provides omega-3 essential fatty acids... Average men should have from 18 to 24% of body fat, while average women should have from 25 to 31% of body fat. This amount is necessary to keep them warm and healthy. An unbalanced diet, lack of physical activity and other factors can lead to a situation in which more and more fat will be stored in the body. This condition is known as obesity and is a risk factor for many other diseases, such as type 2 diabetes, coronary heart disease and arthritis.

Your challenge is to design a weekly food plan for one of the two people d guidelines indicated by the Eatwell Guide. Your task is to help them lose w macro- and micronutrients they need.

Margaret is a 40-year-old engineer. She cycles every day to work, where she spends most of her time sitting at the computer. As a manager she is very busy and often comes home late. Her diet consists mostly of ready-to-eat food available at the local shop, and takeaways. She is 162cm tall and weighs 77kg. Her GP suggested that it might be a good idea to change her habits, as her blood cholesterol levels are very high and her pancreas doesn't work properly – if she continues to live as she does, she might even develop type 2 diabetes.

David is a 35-year-ol of his time drivin watches movies or p In his job he is unde with it he snacks on c wife is very concern weighs 102kg (his he dietitian about him habits aren't good a health pro



QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. What does the BMI depend on? (3.2.3.2)
2. What cooking methods can be recommended when cooking meals for peopl (3.3.1.2)

THE CHALLENGE: LOSE-WE
– WHEN LESS IS M

YOUR TASK

Your task is to design a [illegible] food plan for one of the individuals d
overview p[illegible]e.

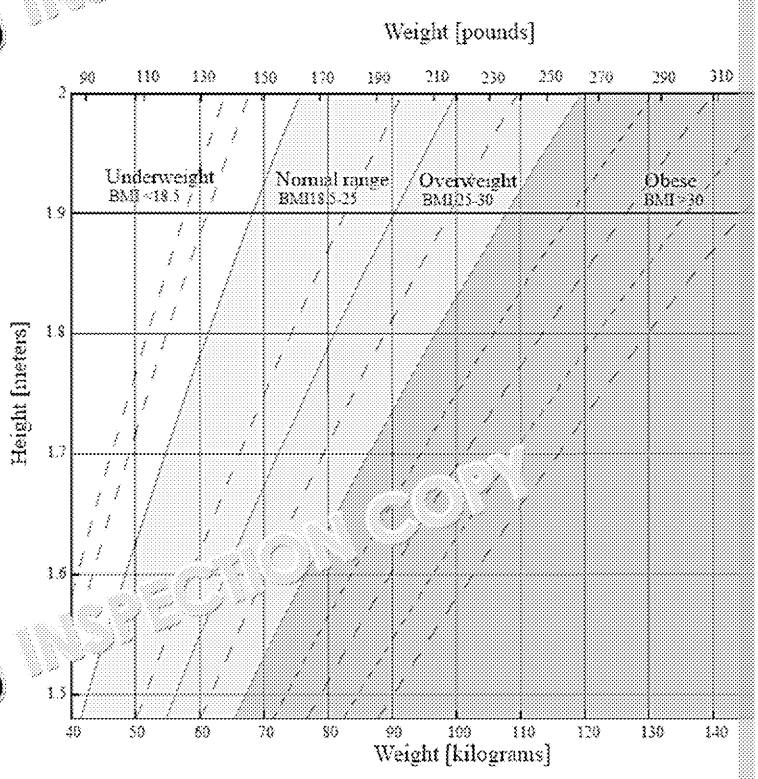
Divide into [illegible] groups – **groups 1 and 2** will have to design a food p
groups 3 and 4 will have to design a food plan for David.

During planning, remember to take the following into consideration
- The food plan has to follow the Eatwell Guide guidelines
- It has to be appropriate for the chosen individual
- It has to provide all the macro- and micronutrients in the correct
  COMA Policy in 1991
  (**https://www.nutrition.org.uk/attachments/article/234/Nutrition%**
  %20Oct%202016.pdf)

1. Begin by calculating the BMIs of Margaret and David. Put a cross in the diag
   is on the BMI scale.

   Margaret's BMI = ...

   David's BMI = ...



2. I am designing the food plan for
   - ❑ Margaret
   - ❑ David

3. i. Calculate the Basal Metabolic Rate for your chosen individual using one

BMR men=(10 × weight in kg)+(6.25 × ight in cm)–(5 × a
BMR women=(10 × weight in kg) × .2 × height in cm)–(5 × a

.....

.....

ii. Read the description again and assess the Physical Activity Level of you calculate the Total Energy Expenditure of that person.

Inactive, sedentary lifestyle -> PAL 1.4
Moderately active lifestyle -> PAL 1.6
Very active lifestyle -> PAL 1.8

Total Energy Expenditure:

.....

.....

iii. Earlier you calculated the BM[illegible] individuals. You surely noticed th body weight. In ord[illegible] lose weight, they need to eat fewer calories th that your fo[illegible] will help them lose weight, subtract 500 kcal from t n[illegible] of calories is equal to the number of calories stored in 50g of a ab[illegible]se around 350g a week.

The calorie intake from diet for ..... will be ..... k

4. Knowing how much energy your diet should provide, calculate how much of protein, fats and carbohydrates.

	Protein	Fats	Carbohydrates
%			
kcal			

5. Open the document at **zzed.uk/7983-re[illegible]ir[illegible]** and check the nutrition individual. Are there any macr[illegible] micronutrients which he/she should pro Justify your answer.

..... should eat **more/less** ..... because

.....

.....

..... should eat **more/less** ..... because

.....

.....

..... should eat **more/less** ..... because

.....

.....

..... should eat **more/less** ..... because

.....

.....

6. Before you begin to design the food plan, draw a diagram in which you will i
healthy diet stated by the Eatwell Guide.

7. When ...ng your food plan, remember to think about the lifestyle of yo
possible for David and Margaret to cook fresh meals every day? Or maybe t
of food and freeze it to eat for the rest of the week? Make sure that the me
appropriate for their health, but also fit into their lifestyle.

Fill in the table on the next page and colour-code meals which provide fruit o
portions of veg or fruit every day?

EVALUATION

**Take some time to evaluate this cl...ng, noting down anything y
would potentially change ...**

.....

.....

.....

.....

	Day 1	Day 2	Day 3	Day 4	D
Breakfast					
Drink					
Snack					
Drink					
Lunch					
Drink					
Snack					
Drink					
Dinner					
Drink					
Total kcal					

RICKETS

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

✓ Planning meals and diets for specific dietary groups, preschool children

LEARNING OUTC

Students should be able to:

- ❑ understand the meaning of calcium, ph and vitamin K for healthy bones and tee
- ❑ indicate the causes of rickets
- ❑ plan balanced diets for preschool childr current recommendations
- ❑ choose the ingredients which provide c
- ❑ indicate that vitamin D is also produced exposure

SAFETY TIPS

! Make sure that students who are allergic to any food ingredient **fish** and **eggs**) do not actively participate in the challenge.

! Remind students about the safety rules when handling allergens apply them to prevent cross-contamination of foods.

! Ensure that students handle hot food/dishes with care.

GUIDANCE FOR TEACHING:

- ➢ Allow students one week to prepare the theoretical part of the activity (over two of the students' worksheet).
- ➢ Only hand out the third page of the students' worksheet once the plans for t
- ➢ Ask students to bring all the ingredients they included in their plans – they w to cook.

WHAT YOU WILL NEED:

Equipment:	In
Standard cooking equipment: saucepans, frying pans, oven, cooker, chopping boards, knives, spoons, etc.	Students should be abl ingredients. You may w ingredients only, such a

ACTIVITY ANSWERS

1. The reference nutrient intake for preschool children (age 4–6) for calcium is 450mg a da

2. i. The dietary guidelines for children include the '5532' plan, which stands for:
   - 5 meals a day
   - 5 portions of fruit and vegetables
   - 3 portions of milk or dairy
   - 2 portions of protein-rich foo

   ii. Children fed a vegeta die should eat three portions of protein-rich foods a
   iii. When planni fo children, one should avoid using large amounts of add be s. e latest guidelines also advise limiting consumption of fruit juices fre instead.

3. When planning a diet to prevent rickets, it is very important to remember the corre calcium.

Sources of vitamin D	So
• Oily fish and fish oil • Egg yolk • Milk and dairy • Soy and soy products • Mushrooms • Fortified foods, e.g. vegetable fat spreads	• Milk and dairy • Soy and soy produ • Fish eaten with bo • Nuts, e.g. almond • Green leafy vegeta • Fortified foods, e.g

Exemplary daily food plan for preschool children rich in vitamin D and calcium:
- **Breakfast:** fortified cereals with whole milk and nuts, unsweetened te
- **Snack:** wholemeal toast with egg and Cheddar cheese paste, apple juice
- **Lunch:** mushroom cream soup, salmon, kale salad, potato mash with b
- **Snack:** hazelnut and milkshake, banana pancakes
- **Dinner:** tuna with cheesy sauce, unsweetened fruit tea

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. Growth spurt is the process/time during which a child or teenager grows rapidly in h

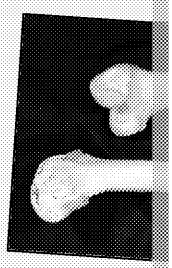
2. The skin

3. Vitamin K, which is produced in the bowel by probiotic bacteria

Rickets

The Challenge Overview

Rickets is a rare disease caused by calcium and vitamin D deficiency in children. As an effect, their bones cannot grow and develop properly, their skeleton is misshapen and muscles cannot attach to it properly, and as a result moving or walking is painful, difficult and often impossible. In today's world, rickets usually occurs in developing countries or where children are malnourished and don't get enough nutrients from food.



In rickets, b… to bend, so … ar…

The most important nutrient in the prevention of rickets is vitamin D. It can be produced in the body due to exposure to sunlight, as well as provided with food.

Your challenge is to prepare a daily food plan for preschool children. Y… recommended amount of calcium and vitamin …

Questions to think about!

Discuss these questions with a partner or make notes in your books.

1. What is growth spurt and how does it affect nutritional needs of children? (…
2. Which organ produces vitamin D in the body? (3.2.2.1)
3. What other vitamins can be produced in the human body and in what organ?

The Challenge: Rickets – force (of calcium) be

Your Task

Rickets is caused by insufficient amounts of calcium and vitamin D i
prepare a daily fo[illegible]or preschool children to include the reco
calcium [illegible]itamin D. Remember that preschool children are, we
won't eat [illegible]n and will be rather fussy!

Divide into two large groups to prepare the plan.

Open the document at:
https://www.nutrition.org.uk/attachments/article/234/Nutrition%20Requireme

1. Begin by checking how much calcium and vitamin D preschool children actu

   Calcium: .....

   Vitamin D: .....

2. i. The dietary recommendations for preschool chil[illegible] are known as the
   mean?

   5 means .....

   5 m[illegible] .....

   3 [illegible] .....

   2 means .....

   ii. Are there any conditions under which this scheme needs to be changed

   .....

   .....

   iii. What other recommendations are there for planning a diet for prescho

   .....

   .....

   .....

   .....

3. Use the template on the next page to plan the diet for a preschool child. Re
   calcium and vitamin D is provided with each meal.

1st meal:

Ingredients:

2nd meal:

Ingredients:

3rd meal:

Ingredients:

4th meal:

Ingredients:

5th meal:

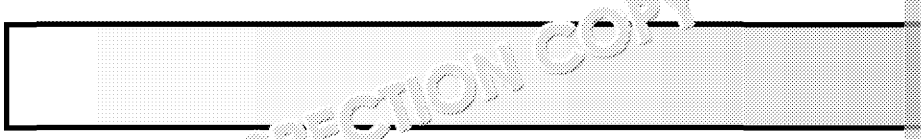
Ingredients:

6th meal:

Ingredients:

4. Once the plans are ready, swap them between groups. In each group divide
are meals in the plan, and try to cook them.

   At the end of the lesson set up a tasting panel to try all the meals made in cl
the least liked to the most liked.



Blurgh! (least
Y

5. Choose the three meals which your class picked as best. Do you think presc
you? Why / why not?

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

EVALUATION

**Take some time to evaluate this challenge, noting down anything y
would potentially change next time.**

.....

.....

.....

.....

Osteoporosis

Teacher's guidance

What's covered in this session:

- ✓ Planning meals and dishes specifically tailored to the elderly – the elderly, osteoporosis, lactose intolerance

Learning Outcomes

Students should be able to:

- ❑ understand the mechanisms and causes of osteoporosis
- ❑ understand why osteoporosis is a great concern
- ❑ explain how to improve bone density through dietary changes
- ❑ choose ingredients which fulfil various criteria: dairy free, rich in calcium, easy to digest

Safety Tips

! Make sure that students who are allergic to any food ingredient (e.g. **milk** and **tree nuts**) do not actively participate in the challenge.

! Remind students about the safety rules when handling allergens and apply them to prevent cross-contamination of foods.

! Ensure that students handle hot foods/dishes with care.

Guidance for teaching:

- ➢ This is an open activity to help students develop their planning skills. Allow students to work on the practical part of the project and two hours to prepare the food.
- ➢ Ask students to bring all the ingredients they are planning to use, as well as equipment to use something which is usually not available in your test kitchen.

Extend learning:

+ Food Fact Sheet about calcium and the amount of calcium in common foods: **https://www.bda.uk.com/foodfacts/Calcium.pdf**

What you will need:

Equipment:	Ingredients:
✓ Oven and cooker ✓ Baking tins ✓ Saucepans ✓ Bowls ✓ Chopping boards ✓ Knives ✓ Food processors, hand mixers, whisks	Students should be able to source ingredients. You may wish to provide ingredients only, such as:

Activity Answers

1. Susan's BMI = 70kg/(1.55)^2 = 29.13kg/m^2

2. Calcium deficiency can lead to such conditions as rickets, tooth decay, hypertension, tachycardia (fast heartbeat), and many others.

3. Nutrients necessary for bone health include: calci..., ph...phorus, fluoride, magnes...

4.

Calcium	Ph...	Fluoride	Magnesium	
70...	...0mg	3mg*	270mg	

* ht...edlineplus.gov/ency/article/002420.htm
** **https://ods.od.nih.gov/factsheets/VitaminK-HealthProfessional/#h2**

5. Some foods rich in calcium include:
   - Milk and dairy
   - Bony fish, such as sardines
   - Nuts, such as almonds
   - Leafy green vegetables, such as broccoli
   - Calcium-fortified bread, flour, juices, soy products
   - Oily fish and fish oil
   - Egg yolks

6. These nutrients can be provided with milk and dairy (calcium, phosphorus, vitamin D, magnesium, vitamin K), sea fish and seafood (calcium, fluoride, vitamin D). Phospho... of foods and its deficiency is very rare.

7. Exemplary high calcium dishes:

Yoghurt, kale and appl... cocktail with ...on	...Wholemeal toast with sardine and egg paste	Almond milk set cus...

What to avoid?

- ✓ Carbonated soft drinks which contain phosphoric acid, as it can deplete the bo...
- ✓ Salt, because sodium increases the amount of calcium which is being excreted ...
- ✓ Excess protein, as in the metabolic cycle it is broken down into sulphates, whic... excretion
- ✓ Insoluble fibre, because it impairs calcium absorption in the gut
- ✓ Alcohol, caffeine and smoking – all of these are known to affect calcium balan...

'Questions to Think About' Answers:

1. Lactose is a disaccharide built from one molecule of glucose and one molecule of ga... mammals' milk.

2. - **Food intolerance** is when a person's di...sti...e s...m cannot digest a food ing... diarrhoea and other symptom... Fo... ...erances usually develop during a pe...
   - **Food allergy** is when a ...son'... immune system reacts to a food ingredient, le... other genera... ...is... which can possibly be dangerous. Food allergies are o... (b... ...t ...n children grow out of them and don't show any signs of aller...

3. - These bacteria are called probiotics.
   - Fermentation is used to make such foods as yoghurt, cheese, kefir, sauerkraut...

OSTEOPOROSIS

THE CHALLENGE OVERVIEW

Osteoporosis is a disease which affects mostly the elderly. In osteoporosis, the bones become porous and brittle – they are very easy to break – and difficult to heal. This has a big impact on the quality of life and life expectancy of the patient. On top of that, many of these people are also lactose intolerant – this means that the main source of calcium in a healthy diet – milk – cannot be given to them, in order to avoid health complications.

Your challenge is to plan and prepare a dish for the person described below in calcium without using milk or any dairy produ

Name: Susan
Age: 65
Weight: 70kg
Height: 1.55m
Conditions and diseases: osteoporosis, lactose intole
RNI for calcium: 700 mg/day

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. What is lactose? (3.2.1.3)
2. What is the difference between food intolerance and food allergy? (3.5.1.2)
3. What do you call bacteria which ferment lactose into lactic acid? What food (3.4.1.3)

THE CHALLENGE: OSTEOP
THE BARE BONES

YOUR TASK

Work in groups of [illegible] develop recipes which are high in calciu
dairy pro

Your task is to design a dish which would provide at least 30% of the
(indicated on the overview page). Remember that you CANNOT u
sure that the portion size is appropriate so that it can be eaten in o
to calculate the nutritional value of your dish. Good luck!

1. Calculate Susan's BMI.

.....

2. Calcium deficiency is one of the main causes of osteoporosis. What other d

.....

.....

.....

.....

3. What nutrients, other than calcium, are necessary to maintain bone health?

.....

.....

.....

4. Use the following website: **zzed.uk/7983-requirements** to check what Susan
can also use other sources to find relevant information.

.....

.....

.....

.....

5. What food products are rich in calcium?

.....

.....

.....

.....

6. What food products provide the other substances necessary for bone he

.....

.....

.....

.....

7. I am planning to cook:

.....

.....

8. Draw or describe ingredients which you are going to use in your recipe:

9. Fill in the table to show step by step how you made or are going to make yo

	Procedures
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

10. Once your dish is done, ask up to 10 classmates to taste it and indicate how m
each answer in the table with a tick. Then, sum up ticks in each column to see

	Dislike extremely	Dislike	Neither like nor dislike	
Person 1				
Person 2				
Person 3				
Person 4				
Person 5				
Person 6				
Person 7				
Person 8				
Person 9				
Person 10				
Total:				

11. Did your classmates like your high-calcium dish or rather not? What could y

.....

.....

12. Calculate the nutritional value of your di[illegible] can use the online tool at **http://explorefood.foodafact[illegible]/** or food tables.

Create a f[illegible] your meal to include the main macronutrients and m
and ot[illegible] stances necessary for bone health, which you indicated earlier)
amount[illegible] utrients both per 100g and per serving.

EVALUATION

**Take some time to [illegible] this challenge, noting down anything y
would p[illegible] change next time.**

.....

.....

.....

LACTOSE INTOLERAN

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

- ✓ Planning meals and [illegible] special [illegible] lactose intole[illegible]
- ✓ Setting [illegible] mixture
- ✓ Replacing ingredients in recipes

LEARNING O[illegible]

Students should be able to:

- ❑ understand the mechanisms of [illegible]
- ❑ choose lactose-free ingredients
- ❑ explain why some dairy product[illegible] lactose intolerance
- ❑ make substitutions and modificat[illegible]

SAFETY TIPS

! Remind students about the safety rules when handling high-risk [illegible] apply them to prevent cross-contamination of foods with lactos[illegible]

! Make sure that students who are allergic to **wheat**, **milk**, **eggs**, **s**[illegible] actively participate in the challenge

! Ensure that students handle hot foods/dishes with care.

GUIDANCE FOR TEACHING:

- ➢ Prior to the lesson, soak the [illegible] in water overnight to soften and m[illegible] Drain on a strainer.
- ➢ To short[illegible] the [illegible]on time, consider not using any base for the cheese[illegible]
- ➢ To sho[illegible] setting time, consider using small glasses to prepare single po[illegible]

WHAT YOU WILL NEED:

Equipment:	I[illegible]
✓ Round tins with removable ring ✓ Large bowls ✓ Saucepans ✓ Cooker ✓ Fridge/freezer ✓ Food processors ✓ Hand mixers ✓ Whisk ✓ Juicer	There is a wide variety [illegible] complete this activity. [illegible] worksheet for guidanc[illegible] other foods not includ[illegible]

ACTIVITY ANSWERS

1. • Lactose content of the traditional cheesecake is around 26.3g/batch.

2. • **Group 1:** the **traditional cheesecake** provides around 241.8 kcal / 100g.
   • **Group 2:** the **soy-based cheesecake** provides around 253.4 kcal / 100g,
   • **Group 3:** the **cashew-based cheesecake** provides ar[illegible] 415 kcal / 100g.

4. In general, cheeseless cheesecakes are [illegible]lt[illegible]ative for those who cannot eat [illegible] lactose intolerance or vegan die[illegible]r, the cheese alternatives, such as cashe[illegible] energy than cheese, so t[illegible] should be adjusted accordingly.

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. This is because during the production process, milk is fermented by probiotic bacte[illegible] acid, lowering its amount in the final product (fully mature cheeses shouldn't conta[illegible] doesn't require any fermentation, so the lactose from cream is left in butter/butter[illegible]

2. **Examples could include:** cauliflower cheese, cottage pie, Yorkshire pudding, Eton m[illegible] anything that contains milk or dairy products.

LACTOSE INTOLERA

THE CHALLENGE OVERVIEW

Lactose is a disaccharide naturally pr[illegible] in [illegible]ammals' milk. It is broken down in the human dig[illegible]stem by the enzyme called lactase. Lactase is usual[illegible]ive in babies, whose only food is milk, but then it m[illegible]s activity during a person's lifetime. Some people, s[illegible] the elderly, may become lactose intolerant due to the enzym[illegible]oming inactive. Not being able to digest lactose properly can cause bloating, stomach ache and diarrhoea.

Do[illegible]

Your challenge is to prepare a lactose-free cheesecake. Your task is to ma[illegible] to the original cheesecake as possible.

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. Why does cheese have less lactose than milk, [illegible]ttle milk doesn't? (3.6.[illegible])
2. Milk is a staple food in England, but can[illegible]t be eaten by many people for var[illegible] intolerance or milk allergy). N[illegible]e traditional British dishes which con[illegible] avoided by such pe[illegible] (3.5.2)

The Challenge: Lactose In
– Udder-Free Cheese

Your Task

Divide into three groups. Each group will follow a different recipe. **Group 1** will prepare a cheesecake using lactose in cheese, while **groups 2 and 3** will prepare cheesecakes without cheese. Once the cakes are done, you will need to compare the cheesecakes. Can actually be made without any cheese in it – and virtually lactose-free.

1. Use the table below to calculate the amount of lactose in a traditional chees

Lactose content in g / 100g		Lactose
Cheddar cheese	0.1	Cottage/cream chee
Whole milk	4.8	Buttermilk
Milk chocolate	9.5	Ricotta cheese
Condensed milk	13	Butter
Yoghurt	3.2	Dark chocolate

Source: **https://www.food-intolerance-network.com/food-intolerances/lactose-intolerance**

The lactose content of the basic cheesecake (ingredients on the next page):

.....

.....

Group 1 - Traditional Cheesecake

INGREDIENTS	PROCED
Base: ❑ 125g **digestive biscuits** ❑ 40g **butter** **Topping:** ❑ 280g **cream cheese** ❑ 400g (1 can) **condensed milk** ❑ 140ml lemon juice ❑ 100g **milk chocolate**	

1	Crush the biscuits into fine crumbles
2	Melt the butter o
3	Mix the butter wi
4	Spoon into a roun to the bottom to
	Refrigerate for 15 butter to set
	Th
6	Whisk the cream with condensed m then add lemon ju
7	Pour over the bas until set
8	Melt the chocolat and pour on top o

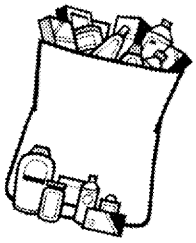
2. While the cheesecake is chilling, take the time to calculate its energy conten

.....

.....

Group 2 – cheeseless cheesecake 1

INGREDIENTS	PROCED
Base: ❑ 125g di ive ❑ 40g m e **Topping:** ❑ 280g **soy** cream cheese ❑ Juice squeezed from one lemon ❑ 50g icing sugar ❑ 40g margarine ❑ 40g **soy** milk ❑ 10g cocoa powder ❑ 10g caster sugar **Source:** • *http://www.jamieoliver.com/recipes/member-recipes/recipe-detail/1282/*	1 Crush the biscuits into fine crumbles 2 Melt the margari 3 Mix the butter wi 4 Spoon into a roun to the bottom to 5 Refrigerate for 15 margarine to set **Th** 6 Whisk the cream with condensed m then add lemon ju 7 Pour over the bas until set 8 Melt the chocolat and pour on top o 9 Pour the sauce on



2. While t esecake is chilling, take the time to calculate its energy conten

.....

.....

Group 3 – cheeseless cheesecake 2

INGREDIENTS	PROCED
Base: ❑ 125g **digestive biscuits** ❑ 40g margarine **Topping:** ❑ 180g **cashew nuts** ❑ Juice squeezed from one le[illegible]mon ❑ 50g icing sugar ❑ 80g c[illegible] o[illegible] ❑ 150m[illegible]ut milk ❑ 40g margarine ❑ 40g **soy** milk ❑ 10g cocoa powder ❑ 10g caster sugar **Source:** • *http://minimalistbaker.com/7-ingredient-vegan-cheesecakes/*	 **1** Crush the biscuits into fine crumbles **2** Melt the margari[illegible] **3** Mix the butter wi[illegible] **4** Spoon into a roun[illegible] to the bottom to [illegible] **5** Refrigerate for 15 [illegible] margarine to set **The** **6** In a food processo[illegible] cashew nuts with [illegible] until smooth **7** Add icing sugar, le[illegible] coconut milk, and [illegible] **8** Pour over the bas[illegible] until set **9** Melt margarine, c[illegible] powder and milk [illegible] make a sauce **10** Pour the sauce on[illegible]

2. While the cheesecake is chill[illegible] time to calculate its energy conten[illegible]

.....

.....

3. Once all the cheesecakes are set, remove them from the fridge/freezer and [illegible] each of the cheeseless cheesecakes to the real one and assess how much th[illegible]

	The real cheesecake	Cheeseless cheesecak[illegible]
Appearance		
Aroma		
Texture		
Creaminess		
Tas[illegible]		
Lacto[illegible]ontent in 100g		0
Calorie content in 100g		

4. After the assessment, do you think it is a good idea to replace the real chees substitutes? Why / why not?

.....

.....

.....

.....

.....

.....

EVALUATION

Take some time to evaluate this challenge, noting down anything would potentially change next time.

.....

.....

.....

.....

FOOD CHOICES – RELI

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

- ✓ Planning meals and di… special dietary … religion
- ✓ Inter… la…ls – finding foods …le for various religious groups

LEARNING O…

…dents should be able to:

- ❑ explain how religion affects pe…
- ❑ identify dietary restrictions ass… and beliefs
- ❑ choose ingredients, cooking me… characteristic of chosen religion

SAFETY TIPS

! Make sure that students who are allergic to any food ingredient… participate in the challenge.

! Remind students about the safety rules when handling allergen… apply them to prevent cross-contamination of foods.

! Ensure that students handle hot foods/dishes with care.

GUIDANCE FOR TEACHING:

- ➢ Take three (or more – see belo… …c… paper and label them to indicate … Judaism, Hinduism and … Fold the cards in half and place in a box (or an… into thre… grou… …ow each group to draw one card.
- ➢ This is … activity to help students develop their planning skills. Allow s… theoreti… part of the project and 90 minutes to cook (use the remaining tim…
- ➢ Ask students to bring all the ingredients they are planning to use, as well as … use something which is usually not available in your test kitchen.
- ➢ Turn this activity into a *Masterchef* contest to see how students cope with s…
- ➢ During assessment make sure that students use only the allowed ingredient… or beef in a Hindu dish).
- ➢ To make this task more difficult, do not allow students to use half-products, … or shortcrust – this may be of benefit especially for higher-ability students.
- ➢ Encourage students to research foods and dishes characteristic of a given re… foods are forbidden in it.
- ➢ You can consider increasing the number of groups to include other religions … Rastafarianism, Sikhism and Buddhism.

WHAT YOU WILL NEED:

…ment:	I…
Standard c… equipment: saucepans, frying pans, oven, cooker, chopping boards, knives, spoons, etc.	Students should be ab… ingredients. You may … ingredients only, such …

ACTIVITY ANSWERS

1.

	i. Foods permitted	ii. Foods forbidden	iii. Spices and characteri
Islam	Only meat labelled as halal Fish are generally OK	Pork and any pork products Alcohol Se[illegible] without scales or fins (e.g. crab, prawns)	Islam is usually associated with Middle East, and therefore, the sp and herbs used i cumin, cardamo nutmeg, turmer sumac, caraway, aniseed, cinnam
Judaism	Only foods labelled as kosher can be used Alcohol (e.g. red wine) can be used Unleavened bread	Shellfish, pork Meat cannot be served together with dairy, nor chicken with eggs Leavened bread is forbidden during the Sabbath	Asafoetida, cape caraway, costus, dill and fennel, g hyssop, lavende mustard, peppe saffron, sesame
Hinduism	Milk and dairy Mainly vegetarian	Beef Cheese made with the use of rennet Some Hindus may refuse to eat eggs, and also onion and garlic Alcohol	Spices character Indian cooking i cardamom, clov cassia cinnamon, pepper, cumin, coriander, nutme mace, mustard s fenugreek, turm saffron

'QUESTIONS TO THINK ABOUT' ANSWERS:

1. Example[illegible]d include:
   - Judaism: Shabbat, Rosh Hashanah, Yom Kippur, Hanukkah, Purim, Passover
   - Islam: Eid-al-Fitr, Eid-al-Adha, Hajj
   - Hinduism: Diwali, Holi

2. Examples could include:
   - Judaism: challah bread, matzo, latkes
   - Islam: baklava, halva, ketupat
   - Hinduism: ghee, pongal, modak

FOOD CHOICES: RELI

THE CHALLENGE OVERVIEW

Religion is an important factor which affects ' ' ices of people all ar
on your belief, you may eat fish or c on a Friday or challah on a S
decide what and when pe e cannot eat, what are the special
specific foods are ea

**Your challenge is to prepare a three-course meal which will consist of a
characteristic of a given religion. Your task is to choose the ingredients a
you make it in time – but remember they need to fulfil the criteria set**

These are candles floating on water, characteristic for Divali (festival of lights in Hindui
candles (sometimes thousands) are lit up and arranged in beautiful patterns. The pictu
sweet loaf made with marzipan and dried fruits for Christmas (in Christianity)

QUESTIONS TO THINK ABOUT

Discuss these questi a partner or make notes in your books.

1. What sp ial occasions for feasting in Judaism, Islam and Hinduism?
2. Name d d characteristic of each of the religious festivals indicated in q

THE CHALLENGE:
FOOD CHOICES: RELI

YOUR TASK

Divide into three grou[illegible] each group, draw a card from the box
prepared to disc[illegible] that religion you will have to cater for. The to
meal co[illegible] of a starter, main and dessert for the religion drawn.

Make sure that all the ingredients you are planning to use are allow

Your time for completion is 90 minutes.

1. I am preparing a meal for:
   - ❑ Muslims
   - ❑ Jews
   - ❑ Hindus
   - ❑ Other: .....

   i. Foods I can use:

   .....

   .....

   ii. Foods which ar[illegible] :

   .....

   .....

   iii. Spices and herbs characteristic of that culture:

   .....

   .....

   iv. Cooking methods characteristic of that culture:

   .....

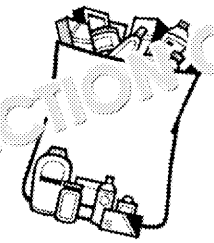
   .....

2. I am going to cook:

Starter	Main	

3. **Starter:**

Planned preparation time: ……. How long it actually too

INGREDIENTS	PROCED
❑ 	1
❑	2
❑	3
❑	4
❑	5
❑	6
❑	7
❑	8
❑	9
❑	10
❑	11
❑	12

Why did I choose this dish?

……

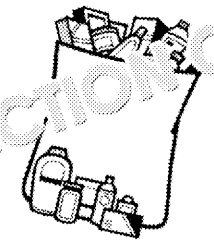
……

……

Attach a picture of your dish here:

4. **Main:**

Planned preparation time: ……. How long it actually too

INGREDIENTS	PROCED
❑ 	1
❑	2
❑	3
❑	4
❑	5
❑	6
❑	7
❑	8
❑	9
❑	10
❑	11
❑	12

Why did I choose this dish?

……

……

……

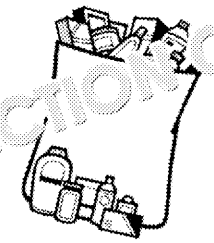
……

……

Attach a picture of your dish here:

5. **Dessert:**

Planned preparation time: ……. How long it actually too

INGREDIENTS	PROCED
❑ 	1
❑	2
❑	3
❑	4
❑	5
❑	6
❑	7
❑	8
❑	9
❑	10
❑	11
❑	12

Why did I choose this dish?

……

……

……

……

……

Attach a picture of your dish here:

6. At the end of the lesson your classmates from other groups will assess your
Use the template below to make sure you didn't omit anything important.

What religion is this dish made for?

.....

i. Are all the ingredients used allowed to be e... t at religion?
ii. Is the dish characteristic of the giv... u... ..., religion?
iii. Is the dish served in the w... ic... characteristic of this culture/religi
iv. Is the dish appeti...
v. Does the d... nice?
vi. D... ast... good?

Comments:

.....

.....

.....

.....

.....

.....

.....

EVALU... MI...

**Take some time to evaluate this challenge, noting down anything y
would potentially change next time.**

.....

.....

.....

.....

Cooking on a budg

Teacher's guidance

What's covered in this session:

- ✓ Planning meals and [illegible] special [illegible] low-budget
- ✓ Food [illegible]
- ✓ Food [illegible]
- ✓ Using leftovers to prevent food waste and promote good practices

Learning

Students should be able to:

- ❑ understand the importanc
- ❑ indicate various means of
- ❑ identify causes of food wa
- ❑ plan balanced meals which
- ❑ calculate the cost of recipe
- ❑ identify effects of malnutri

Safety Tips

- ! Make sure that students who are allergic to **eggs**, **wheat**, **milk** o intolerant, do not actively participate in the challenge.
- ! Remind students about the safety rules when handling allergen apply them to prevent cross-contamination of foods.
- ! Ensure that students handle hot foods/dishes with care.

Guidance for teaching:

- ➢ Allow students 15 [illegible] choose the ingredients and calculate the cost. minute[illegible]oc[illegible]g.

What you will need:

Equipment:	I
✓ Standard cooking equipment: saucepans, frying pans, oven, cooker, chopping boards, knives, spoons, etc.	There is a wide variety complete this activity. worksheet for guidanc other foods not includ you to use any leftove sessions).

Activity Answers

2. As stated in the task description, this can be either one dish (e.g. a plate of spaghet sandwich and a bowl of soup). Students can choose what to cook as long as it fits i

5. Some effects of nutrient deficiency could include:
   - weak, brittle hair and nails (lack of protein, vitamin A, other nutrients)
   - dry, flaky skin (lack of fat, vitamins A and E, th nutrients)
   - dry, cracked skin, e.g. in the corne n th (lack of group B vitamins)
   - anaemia (lack of iron, vita ate)
   - weight loss (lack , ates, fats and protein)
   - fee muscle strength (lack of protein)

6. An imba a diet can result in deficiency or excess of a nutrient, causing further h processed, sugary, high-fat foods are often cheaper and, therefore, more affordable alternatives. It is important that even those less privileged eat a healthy diet. This
   - using cheap protein sources, e.g. cheese instead of meat, lots of milk and dairy, of meat
   - searching for offers, e.g. vegetables and fruit are often cheaper when close to
   - buying less food, but of a good quality
   - using seasonal foods – in season they are often available at very low prices

'Questions to Think About' Answers:

1. Examples could include (any three from):
   - Writing a shopping list to buy only the foods needed
   - Not cooking too much
   - Not putting too much on the plate
   - Reusing leftover food and scrapes
   - Freezing uneaten food for a la se

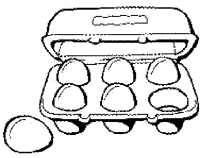
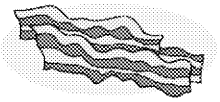
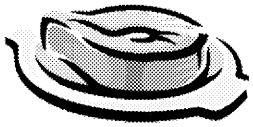
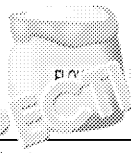
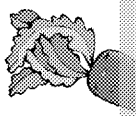
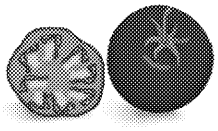
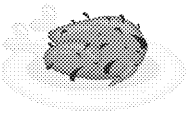
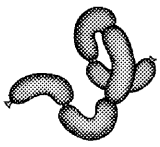
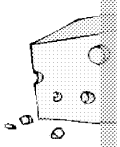
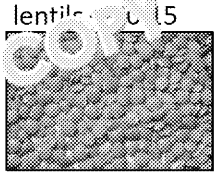
2. Examples could inc ee from):
   - Ir ie aemia
   - Sc
   - Weight loss
   - Kwashiorkor
   - Night blindness
   - Osteoporosis

COOKING ON A BUD

THE CHALLENGE OVERVIEW

Money is one of the most important factor which determine one's food c
buying food, we often need to choose between quality and quantity. Fo
problem, even in developed countries such as Great Britain. According to
2014 over 8.4 million British citizens struggled to put food on their tables.

**Your challenge is to prepare a healthy, low-cost dish for under £1 per po
the ingredients from the list below to cook it. Are you ready f**

1 **egg** – £0.25 	1 bacon rasher – £0.20 	1 slice of **bread** or 1tsp **breadcrumbs** – £0.10 	1 glass o £0. 
100g tinned **fish** – £0.60 	1 tablespoon of **flour** – £0.05 	1 teaspoon of sugar – £0. 	1 carrot 
100g lefto ta mash 	fresh tomato – £0.35 	100g chicken – £0.40 	10g **butte** 
1 tablespoon oil – £0.20 	1 sausage – £0.40 	1 onion – £0.05 	50g **chees** 
1 handful spinach – £0.15 	100g mushrooms – £0.25 	100g dried red lentil 5 	100g f sweetcor

QUESTIONS TO THINK ABOUT!

Discuss these questions with a partner or make notes in your books.

1. List three ways in which you could limit food waste at home. (3.6.1.2)
2. Name three diseases caused by undernutrition. (3.2.)

The Challenge: cooking on a
'cos money doesn't grow o

Your Task

Divide into groups of three or four. The task is to plan and cook a d
costs less than £1.0 per portion.

Plan your shopping wisely – you need to prepare a dish which is che
Will you prepare one large dish or do you prefer to prepare single p
dishes? The choice is yours!

You don't have to pay for the water, electricity or gas – but remem
probably would have to take these costs into account too!

1. My shopping list:

Product	Amount	Cost	Product	Ar

Total cost of shopping:

.....

2. Now that you've decided what ingredients you want to use, decide what the
below and annotate the picture to identify its various components (you can
components).

Now it's time to cook and cool your dish. In the meantime, answer the ques

3. i. How many portions did you obtain? .....

   ii. What is the cost of one portion? .....

   iii. What is the size/weight of one portion? .....

   iv. Is the size of the portion sufficient to feed 1 person?
   ❒ yes ❒ no, it's too little ❒ no, it's too large

4. Calculate the nutritional value of your dish. Use an online tool or food table

	Value / 100g	Value per portion	Recom nutrien for te
Energy (kcal)			230
Fats (g)			9
Carbohydrates (g)			3
Protein (g)			8
Iron (mg)			14.
Calcium (mg)			100
Sodium (mg)			240
Vit A			600
Vitamin D (mcg)			10
Vitamin E (mg)			
Vitamin K (mcg)			

5. Does your dish provide all of the nutrients in the table? ❒ yes

   If you answered no – what might be the effect of not eating enough of that/t

.....

.....

.....

.....

.....

6. Suggest some ways in which less wealthy people could provide all of the nec
spending too much money.

.....

.....

.....

.....

.....

EVALUATION

**Take some time to evaluate this challenge, noting down anything y
would potentially change next time.**

.....

.....

.....

.....

IRON DEFICIENCY ANAE

TEACHER'S GUIDANCE

WHAT'S COVERED IN THIS SESSION:

✓ Planning meals and d… for spe… die… …ups: iron d… …cy anaemia, teenag…

LEARNING OUT…

…ts should be able to:

❑ understand the causes and mechanis…

❑ identify groups which are at risk of d… anaemia

❑ plan balanced meals which can impro…

SAFETY TIPS

! Make sure that students who are allergic to any food ingredien… participate in the challenge.

! Remind students about the safety rules when handling allerger… apply them to prevent cross-contamination of foods.

! Ensure that students handle hot foods/dishes with care.

GUIDANCE FOR TEACHING:

➢ Allow students at least three days to pr… re… …heoretical part. Ask stude… they are planning to use.

➢ When assessing stu… …, pay attention to the amount of iron and vit… recipes … ar… …amount of iron, but one is lower in vitamin C, give the … marks.

EXTEND LEARNING:

+ More information about iron deficiency anaemia and iron-rich foods can be … **http://www.nhsaaa.net/media/17787/4irondiet.pdf**

WHAT YOU WILL NEED:

Equipment:	I…
✓ Standard cooking equipment: saucepans, frying pans, oven, cooker, chopping boards, knives, spoons, etc.	Students should be ab… …edients. You may … …ngredients only, such …

Activity Answers

1. The RNI for teenage girls is set at 14.8mg a day.

2. The dish produced in class should provide at least half of the RNI (7.4mg).

4. When planning a diet, remember that there are two type[illegible]on: haem iron, which is easier absorbed in the body, and non-haem iro[illegible]g in plant foods, which is remember that high vitamin C may enha[illegible]so[illegible]on, while high fibre levels can a

6. Vitamin C

7. The am[illegible] vi[illegible]in C in the dish can be increased, for example, by adding fresh, fruit. Re[illegible]er that during cooking (boiling, simmering, etc.) vitamin C degrades a less vitamin C than raw ones.

'Questions to Think About' Answers:

1. Folate (folic acid, vitamin B9) and vitamin B12.

2. Teenage girls and women need more iron due to menstruation (when some iron is lo pregnancy (when extra iron is needed for the foetus to grow properly and to restor

Iron deficiency ana

The Challenge Overview

Iron occurs in food products in two different forms: haem iron, which is easily absorbed, and non-haem iron, which is absorbed less easily. Iron is used in the body to build haemoglobin – the red pigment in the blood which builds red blood cells and binds oxygen to transport it around the body. If there is not enough iron, red blood cells cannot be built, oxygen cannot be transported and your whole body begins to dysfunction. Such a condition is known as iron deficiency anaemia. It can be caused simply by lack of iron in the diet, but also by deficiency of other micronutrients, impaired absorption or genetic disorders.

Your challenge is to plan and prepare a dish high in iron. Your task is to inc
iron as 50% of RNI for teenage girls for this mine

Questions to think about!

Discuss these questions with a partner or make notes in your books.

1. Deficiency of what other micronutrients can cause anaemia? (3.2.3.4, 3.2.2.1)
2. Explain why teenage girls and women need more iron than teenage boys and

The Challenge: Iron def
anaemia – how to pump th

Your Task

Work in pairs to develop as many iron-rich recipes as possible. Your
prepare an iron-rich dish which will not only be healthy, but also app
Remember that each portion needs to contain as much iron as indicate

1. What is the RNI for iron for teenage girls?

.....

2. How much iron needs to be included in each portion of my dish?

.....

3. Begin by choosing ingredients and indicating how much iron they contain.

	Product name	Amount of iron per 1
Ingredient 1		
Ingredient 2		
Ingredient 3		
Ingredient 4		
Ingredient 5		
Ingredient 6		
Ingredient 7		
Ingredient 8		
Ingredient 9		
Ingredient 10		

4. I am planning to co

.....

.....

5. I think this is a good choice because…

.....

.....

.....

.....

.....

6. Which nutrient increases iron absorption?

.....

7. Is there a way to increase the amount of that nutrient in your dish to improv
ways in which you could do it.

.....

.....

.....

.....

.....

.....

8. While your dish is cooking, calculate its nutritional value (per portion). Indic
macronutrients, iron and the micronutrient which you named in step 6.

9. Research shows that only about 35% of haem iron and a maximum of 20% o effectively absorbed by the body. Calculate how much of each kind of iron y of it will be absorbed into the bloodstream.

	Haem iron	
Amount		
Amount absorbed		

10. Once a ishes in class are ready, set up a tasting panel using the prefer table the number of people who think that your dish is:
    - good ☺
    - so-so 😐
    - bad ☹

	☺	😐
Dish 1		
Dish 2		
Dish 3		
Dish 4		
Dish 5		
Dish 6		
Di		
Dish		
Dish 9		
Dish 10		

11. How was your dish perceived? Whose dishes were worse/better, and why?

.....

EVALUATION

Take some time to evaluate this c le , noting down anythin would potentially change n ti .

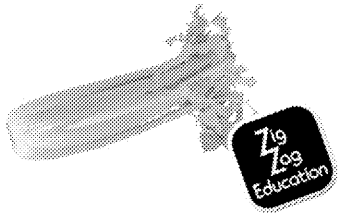
.....

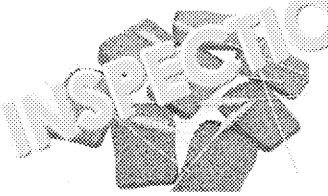
.....

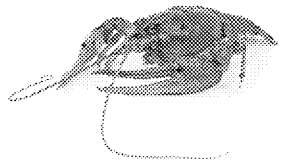
.....

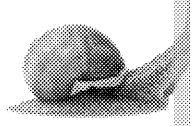
.....

APPENDIX 1 – MAJOR FOOD







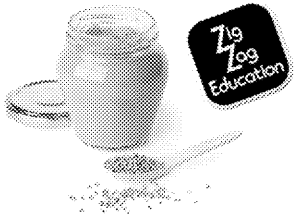


Celery
all parts of the plant (seeds, leaves, stems, root)

Cereals containing gluten
to include wheat, barley, rye and uncertified oats, and all products containing them (e.g. what germ o… soy sauce, bee…

Crustaceans
crab, l…bster, …n, …campi, …hrimp

Mollusc…
mussels, snail… squid, oyste…



Mustard
liquid, powdered and seeds

Milk

Tr… …ts
…i…ie almonds, …ashew, hazelnuts, pecan, macadamia, walnuts

Peanuts

ALWAYS REMEMBER TO READ THE LABEL BEFORE YOU…
FOOD ALLERGENS CAN BE HIDING EVEN IN MOST INNOCENT…