Learn Chemistry

You Are What You Ate

Tutor Guide

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YOU ARE WHAT YOU ATE: THE CHEMISTRY OF THE OBESITY EPIDEMIC.

TUTOR GUIDE

Contextual Narrative

Background.

Context- and problem-based learning, CPBL, on which this resource is based, is a widely used pedagogical technique involving placing the subject matter, in this case the metabolic causes and the incidence of obesity, in the cultural and social environment within which students, tutors and institutions operate. Context-based learning, CBL, is often understood as the use of applications to illustrate and illuminate the curriculum, and for science students this usually means providing them with opportunities to test academic knowledge with real world examples. The traditional approach of introducing real-life context after all the theory has been covered is inverted in CBL, in which the context is used as the driver for learning. Where this approach has been used, evidence has demonstrated that students engage much more enthusiastically with the learning process. In problem-based learning, PBL, as in CBL, the curriculum is organised and driven by real-life contexts. In PBL these contexts are presented in the form of problem scenarios. An important feature of CPBL is that the problems or scenarios are encountered before all the relevant learning has taken place and act as the driver for new learning. Because of this PBL is distinct from traditional problem solving, where problems are generally encountered after learning has taken place.

In the present resource, “You Are What You Ate: The Obesity Epidemic…” students are presented with a problem, the growing incidence of obesity, in a real life context in which the core subject, metabolic chemistry, plays a central role. For the purposes of this resource the local solution to this world-wide problem takes the form of public education through presentations by the students to senior school children. This requires the acquisition of new skills such as use of on-line databases, teamwork and communication skills in addition to skills in the core subject. The students work in small groups, optimally of four or five, and are presented by the tutor with some information to set the scene. The tutor plays a less didactic role after this initial phase, becoming more of a facilitator. Students are given the brief, which in the first instance is to write a persuasive application to a local authority for funding to support the creation of talks to schools in their area and for their delivery. Members of the teams collaborate to acquire additional information and develop a heuristic strategy to complete the formulation of the problem and develop options for a solution. The importance of inquiry as a means of learning is thus emphasised. This approach has been practiced to varying degrees in the physical sciences curriculum during the past decade, and has met with considerable success in terms of enhancing student motivation and consequently higher performance.

The Problem

The RSC Roadmap identifies food and ’creating and securing a safe, environmentally friendly, diverse and affordable food supply’ as a priority for the world. This is usually seen as a strategy to fight starvation in underdeveloped parts of the globe, but in the developed countries a factor of increasing importance in threatening life expectancy is not starvation but obesity – a different aspect of poor nutrition. This resource is designed to use the global relevance and urgency of this problem as a motivational framework for undergraduates in chemistry and allied disciplines.

There is a general public ignorance of the factors involved in maintaining a healthy diet. Food fads, misleading but seductive marketing, superficial press reporting of complex stories (for example on GM foods) and the celebrity chef phenomenon all distract the public from seeking and absorbing evidence-based facts about the food we buy, prepare and eat. The commercially motivated claims of beneficial effects for food additives, which may in fact be beneficial, innocuous or deleterious, are accepted as the results of "scientific testing" when this is seldom the case. The public has no means of judging the claims made to induce them to buy and consume foodstuffs and supplements, and this has a number of consequences detrimental to public health. In particular, aggressive marketing and misleading advertising make unhealthy, fat- and sugar-laden fast foods and soft drinks attractive and readily available. The most obvious and harmful consequence of these factors is the rise in poor nutrition and obesity in all developed countries, with consequent decline in actual and predicted public health. In 2007 approximately 40% of the adult population of the UK were overweight (BMI >25kg.m^{-2}) and a further 20% were clinically obese (BMI >30kg.m^{-2}) with a cost to the NHS of over £3bn. The prospects for the immediate future are bleak. An increasing gap has been noted in general health and life expectancy between the betterinformed and -educated and the less informed, often socially deprived, sections of the public.

It falls to the trained scientist to find ways to inform and enlighten the public about food, nutrition and the risks consequent on a poor diet rich in fats and sugar, especially when that diet is coupled with a sedentary lifestyle. It is a useful goal for chemists to attempt to put this information in an assimilable form for a lay-audience. Unfortunately, the publication in the press of conflicting and poorly reported stories on the risks/benefits of dietary habits has contributed to a general distrust of science and scientists. The problem remains of how to express useful, science-based information on diet and nutrition to counteract the exaggerated claims for "superfoods", "nutritional" additives made by the food industry and the sensationalist reports of miracle obesity cures in the press.

In "You Are What You Ate …" we will use the context of this societal problem to engage and motivate science undergraduates in chemistry and related disciplines to focus on the acquisition, development and dissemination of chemical and biochemical knowledge relevant to public health and to the food industry. Students in the course will take the role of teachers for senior schoolchildren, an important target audience for receipt of nutritional and health information. They will write proposal letters to a local Education Authority requesting support for the delivery of talks in schools on the obesity crisis. A crucial component of the course will be the acquisition of analytical and presentational skills by student chemists aimed at fostering the growth of a population of informed young consumers with the ability to make evidence-based choices in food and nutrition. The closeness in age and consonance in life-views between the students and their target audiences adds to the potency of the approach and to the prospect of engagement.

The Structure of the Resource

Students will form teams to construct an appraisal of the problem of overweight, obesity and public health with particular emphasis on the problems these issues pose for children and young adults. They will do this based on information gleaned from public sources such as press coverage, government reports, websites and recommended texts. The knowledge thus obtained will form the basis of a detailed letter to a local education authority with the aim of giving their presentations to senior pupils in local schools. The groups will then construct 20-minute presentations for delivery to schools. The students will also compose a two-page

leaflet or flier to introduce the issues to a sixth-form group, and finally write a report containing policy recommendations to address the problem.

This resource may be used with undergraduates of differing academic backgrounds and at different levels. The appropriate material content and the expectations for the students' performance will be chosen by tutors in alignment with the identity of their department or school and the academic year of the class. Thus senior undergraduates in chemistry would be expected to be more familiar with details of the appropriate metabolic chemistry, as would students at a similar level in biochemistry; students in medical schools perhaps less so, and students in schools of public health etc. would have the least need for that level of detailed chemistry, but would be expected to have a general knowledge of dietary and nutritional content. It is not expected that details of metabolic chemistry be reproduced in the student output from the course but only that an adequate level of knowledge should inform the presentations and reports produced. It is one of the learning objectives of the resource that students acquire the ability to assemble technical information from a variety of sources and then select the crucial components for synthesis into a form more accessible to a general audience.

Students are first given background information on the obesity crisis via a PowerPoint presentation from the tutor, to provide a common starting point. This will also describe an outline of the structure of the course and the tasks that are to be assigned. Groups of four or five students are to be identified by the tutor on the basis of an approximate assessment of ability (mixed ability teams are needed) and the "rules of engagement" outlined. It is important that the students are made aware that self-assessments of the contributions of each team member to the team output will be part of the final assessment of their performance.

In the first phase of the resource students working in the assigned teams are tasked with preparing a letter to a local authority proposing presentations to sixth-formers on the obesity crisis. The teams will also prepare a letter to a school head teacher requesting permission to visit the school (in essence a shorter, informal version of the letter to the Education Authority). One or more of these letters, (after some expert editing as necessary) will be used after the completion of the resource to provide a reality component to the process by sending the top achieving team to a local school to give the presentation. The announcement of this will act as a spur to the student teams and will add a real-life competitive edge to the application process.

A short list of possible resources will be introduced by the tutor, exemplifying information contained in texts, press websites, government reports online and other sources. These sources are such that each is linked, through the original documents, to others that the students will be encouraged to inspect, thus developing their knowledge base. This kind of fractal development of information can be daunting to the uninitiated, and selection of useful information will require a degree of critical appraisal of the content of the sources. Teams should assign the exploration of different aspects of the problem to individual team members and write the proposal letter on the basis of pooled results. The focus and scope of the proposal letters are left to the students and it should be made clear that the presentations they will deliver when their proposals are accepted must reflect the content of the proposal letters. For example they might stress the imbalance of energy input and expenditure in the average adolescent lifestyle, the saturation advertising of nutritionally inadequate fast foods and soft drinks in the media, the interlocking of metabolic pathways that leads to fat deposition, the lack of adequate nutritional information on food packaging, the inadequacy of

public policy on nutrition. Successful proposal letters will show a balance between several possible themes.

Education authority letters will be appraised by the tutor, with some possibility of requiring a rewrite to ensure that all teams are at a similar point before beginning the next phase. On the successful appraisal of the proposal letters the students enter the second phase of the resource as the teams are tasked with the preparation of the talks to be given at school for senior pupils. These will be short, 20 minutes in length, and are to be designed for a technically literate school audience, perhaps with a higher level of science background than the average school population, to enable the student presenters to delve into some metabolic chemistry as the technical underpinning to their talks. They will also be asked to prepare a poster or leaflet to be delivered to schools in advance of their visits to attract an audience and to serve as a reminder of their visits. The talks and posters/leaflets should reflect the theme of the successful proposal letters. The delivery of effective talks, especially short talks, is not a skill that comes naturally to all speakers, especially in presentations that are based on technical information. This is especially the case for inexperienced speakers, and sadly it remains true at quite advanced stages of scientists' careers, as a visit to any large professional meeting will confirm. The acquisition of this skill is another of the goals of the resource. Tutors should introduce some rhetorical and iconographic skills that aid in the construction and delivery of a persuasive and informative presentation. These skills will then be used in student-led short practice presentations in front of the other teams, who will offer their critiques with those of the tutor.

A summary of issues central to the problem of obesity will be given based on which the teams will develop a strategy for developing their schools' presentations. As with the preparation for the proposal letter, some seminal sources of technical, epidemiological, demographic, historical and political information will be provided, and search strategies suggested for this phase. The students should focus on those aspects of the problem that they described in their proposal letters, presumably those that stimulated them the most, thus generating a variety among the presentations. They are to be encouraged to appraise the value of the type of information that they inspect to prevent overload resulting from following every available link. The only prescription is that the presentations they prepare should contain at least some aspects of metabolic chemistry to be made understandable to their prospective audience (more is better). A PowerPoint presentation "Molecules in Metabolism" is provided for delivery in a tutor-led session. Some aspects of public health considerations should of course be included. It will be especially useful in developing the critical faculties of the students for them to compare some items of press coverage of the topic – there is no shortage of sensational examples in the tabloid press, and more balanced and informative coverage will be found by following some selected links provided.

Students will meet with tutors periodically to monitor progress and to be offered guidance where needed to maintain momentum and student engagement.

One team member, selected by each team, will present the team's talk. Practice sessions by the students are encouraged in which short talks (five to ten minutes) are given to develop skills in constructing presentations, increasing confidence and fluency of presentation and optimizing timing. The delivery of the final presentations should be in as realistic a setting as possible. The whole class and tutor(s) will be present for each talk, and other staff might be encouraged to attend to provide an audience that should be able to ask useful questions. Local schoolchildren might also be invited to attend, giving an authenticity to the event.

Feedback from Piloting of the Resource.

From the School of Food Science and Nutrition, University of Leeds.

Tutor comments:

The goals of the work were successfully achieved. The students applied their knowledge of chemistry and biochemistry to understand and explain a complex biological process such as obesity. They used their creativity to develop a presentation aimed at high school students relating to the science of obesity, and proposed solutions to tackling and preventing obesity in adolescents.

The students were given the freedom to choose a topic of interest, and to apply their science knowledge and personal interests to developing some science educational material aimed at secondary school children. The fact that the assignment was a real-life situation allowed them not only to gain knowledge in this area of chemistry but also allowed them to put their knowledge into practice. It is known from employers that graduates are often lacking in 'soft' skills and this resource allowed the students to develop these. Also, if students are applying for jobs within this area in the future, this assignment is something that they can also use to discuss in application forms and interviews to show that they are capable of applying such skills to a relevant situation.

The aims of the resource were met as the interaction of the students with the assignment allowed for both independent thinking as well as effective team work, use of both oral and written communication to a lay audience which is a difficult skill to master and finally problem solving. Overall, the students commented that the assignment allowed them to enhance their knowledge on the subject area and this is through their critical analysis of the information that they found on dietary and metabolic chemistry related to obesity.

Student comments:

- I enjoyed working within a group and presenting to the class, as it improved my confidence around the subject.
- Enhanced my knowledge on how to tackle obesity.
- Like the idea of presenting to adolescents instead of normal students.
- Freedom of topic choice involving obesity.
- Was a very broad subject therefore challenging to pick one certain aspect to tackle. Made us get involved and explore the subject more than just listening in lectures.
- The whole assignment played on my interests in the role of reducing obesity in children.
- The whole assignment and module where very interesting and very relevant to current events.
- The assignment was interesting and was different in the way that normal assignments are structured, therefore it was quite refreshing and stimulating.
- I liked the most, the fact that the assignment could actually be represented in real life.

YOU ARE WHAT YOU ATE: THE CHEMISTRY OF THE OBESITY EPIDEMIC.

TUTOR GUIDE

Operational Guide

The Aim of the Resource

The aim of the resource is the acquisition for students of the following skills:

- Critical analysis of published information on dietary and metabolic chemistry related to obesity
- Team working
- Oral and written communication
- Problem solving

The Subject of the Resource

The topic for the course, the causes of and remedies for the obesity epidemic derives from one of the RSC Roadmap highlights: Healthy Food - increasing understanding of the interaction of food intake with human health to provide food that is better matched to personal nutrition requirements.

Learning Outcomes

After completing the module students will be able to:

- Describe the nature and breadth of the obesity epidemic
- Discuss the prospective societal impact of the rise in obesity in children;
- Discuss the connection between obesity and type 2 diabetes and other pathologies;
- Describe the relative energy content of food, and its composition in terms of carbohydrates, lipids and protein
- Delineate the metabolic pathways for food constituents and the interconnection between them
- Prepare from published sources and deliver a short illustrated talk, suitable for schools, on the obesity epidemic and its causes, and propose possible remedial strategies

Prepare a poster or short pamphlet on the topic and a short report containing policy recommendations to government

Delivering the resource

Formal tutor involvement is limited to some PowerPoint presentations at each stage of the course and providing resource lists. Depending on your goals for the course, the department in which you are delivering the course and the academic stage of your students, you may change emphasis or add supplementary material.

The text recommended is *Nutrition and Metabolism: 4th Edition,* DA Bender CRC Press (2008). One of the aims of the course is to develop the skill of selecting from a voluminous online literature the specific material needed, and students are given some seminal websites throughout the course from which to begin their investigations, with encouragement to follow links to relevant material they require, and for clarification of unfamiliar terminology and concepts.

Students will form teams to construct an appraisal of the problem of overweight, obesity and public health from information in public sources such as the press, government reports and recommended texts. The knowledge thus obtained will form the basis of proposal to the local Education Authority for the development and delivery to schools of an illustrated presentation aimed at technically literate 16-18 year olds on diet, lifestyle and obesity accompanied by a leaflet designed to attract school children to the topic. A written summary report will also be written containing recommendations to government for dealing with the growing crisis.

The course is punctuated by tutor-led sessions for delivering the brief, resource lists, advice on proposal submission, and presentation construction and delivery. PowerPoint slideshows are provided in the resource. It is expected that tutors will have familiarised themselves with the topic through the resource lists provided for distribution to the students.

Session 1. Introducing the Resource

PowerPoint slide show "Introduction".

After the introduction to the course students are assigned to teams of four or five, the Brief is presented, a printed copy of which ("You Are What You Ate: The Brief" in resource documentation) is handed to students. This describes the content, goals and expected outcomes for the course with instruction on how to proceed. The students are next prepared with information they need both to write the proposal letter and for the later design and preparation of their presentations and reports.

PowerPoint slide show "Overview of the Obesity Crisis".

As background to this presentation tutors should familiarize themselves with the general issues covered, using some of the web-based sources (NHS, National Obesity Observatory, Foresight Report *Tackling Obesity*, Diabetes UK) listed in the handouts to be given to the students. The presentation summarises the relevant information. Student teams are then tasked with gathering detailed information from the sources given to them, following links as necessary, to allow them to write and submit the proposal letter. The document entitled "Student Resources for Proposal Letter and Presentation Preparation" in the "Handouts" file (reproduced below) is distributed and discussed.

STUDENT RESOURCES FOR PROPOSAL LETTER AND PRESENTATION PREPARATION

General comment on the use of web-based sources

The websites and text references provided to you throughout this resource are suggested to enable you to make an entry into the vast amount of information available on this important topic. It will immediately become apparent that you cannot read all of it. However, by reading summaries and abstracts of longer documents and following links in these documents that look promising for your team's approach, and looking critically at the content, you will form your own unique picture of the issue, and this will inform the output you produce. A good starting point for a search of the Internet can be a Wikipedia entry that a search will produce.

The following websites will introduce you to some government reports (which are very long), some specialist websites on the topic (e.g. The National Obesity Observatory), the academic

journal literature (e.g. *The Lancet*) and serious reporting in the press (e.g. *The Guardian*). You should not try to read the *Foresight* report in its entirety – the Executive Summary is sufficient, and that it quite long itself. Similarly for the *NHS* site. *The Lancet* "Series Comments" will give you a serious academic point of view. *The Guardian* articles are easily readable and give you the perspective of serious reporting in the national press.

It is important that you try following some of the links in these resources for more information, especially the links in the media stories.The recommended text throughout is *DA Bender: Nutrition and Metabolism: 4th Edition* CRC Press. (2008), and analogous information at greater or lesser levels of complexity can be found by searching online. You should by now feel comfortable in developing your online search strategy. As you come across terminology you haven't seen before, search online for definitions and information. In this way build up your knowledge of the topics. Be careful to appraise critically your sources – an article in *The Lancet* carries much more weight than an article in the tabloid press.

The information you will consider comes under three headings

- The incidence of overweight and obesity
- The causes and consequences of obesity
- Dietary issues and metabolic chemistry

Resources for Incidence of Overweight and Obesity

- Executive summary of the Foresight report *"Tackling Obesity..."* http://www.bis.gov.uk/assets/foresight/docs/obesity/obesity_final_part1.pdfNHS Statistics on Obesity at http://www.ic.nhs.uk/webfiles/publications/003_Health_Lifestyles/opad11/Statistics_on_Obesity_Physical_Activity_and_Diet_England_2011_revised_Aug11.pdf
- Four "Series Comments" in the Obesity issue of *The Lancet* at http://www.thelancet.com/series/obesity.To access the pdf files for these articles you need to register when prompted on the *Lancet* website. It's free.The *National Obesity Observatory* website at http://www.NOO.org.uk/NOO_about_obesity
- Articles from the national media, e.g. *The Guardian* at for example at http://www.guardian.co.uk/society/2011/oct/10/diabetes-the-epidemic and http://www.guardian.co.uk/business/2012/jun/11/why-our-food-is-making-us-fat and the BBC at http://www.bbc.co.uk/health/physical_health/conditions/obesity.shtml
- *Bender* Ch 7, and sections of Ch 6.
- The National Obesity Observatory website at http://www.noo.org.uk/NOO_about_obesity/child_obesity/epidemiology
- Desirable body weight. Distribution of body fat – thoracic and abdominal fat as the risk factor. *Bender* p214
- A site for Body Mass Index (BMI) and desirable ranges for boys, girls, adults and the aged is http://www.bbc.co.uk/health/treatments/healthy_living/your_weight/whatis_bmi.shtml
- Trends in BMI (UK) (*Bender* fig 7.6).

Resources for the Causes, Symptoms and Consequences of Obesity

- Look again at the summary in the Foresight Report *"Tackling Obesities"* Tackling Obesity Note the projected increase in obesity in your geographic area and variations with region for both men and women.
- Sweetened drinks, insulin resistance, metabolic syndrome and type 2 diabetes http://care.diabetesjournals.org/content/33/11/2477.abstract

- BMI and mortality
  http://www.nejm.org/doi/full/10.1056/NEJMoa1000367
- The connection between childhood obesity and lifestyle, income/social class
  http://pediatrics.aappublications.org/content/early/2011/06/23/peds.2011-1066.abstract
- Children's diets
  Report on children's cereal US
- Data on weight gain among young people over the past 10 years in the above context.
  Foresight Report
- Low-income dietary habits. Obesity in Children NOO

Resources for Dietary Issues and Metabolic Chemistry

In order to provide the chemistry content for your presentation you will need to look in some detail at the metabolic chemistry of carbohydrates, fats and proteins. Your proposal letter need not go into this in detail, but your presentation must include some aspects of this. The recommended text *Nutrition and Metabolism: 4th Edition* DA Bender: CRC Press. (2008) is useful for this, but as before you will be able to accomplish your goal based on information you find using the search strategy you have established using the sites already suggested and links in them. The result of your study should enable you to focus on how the body stores metabolites, (from digestion and metabolism of carbohydrates, fats and proteins) which are excess to energetic needs, as fat deposits, the central issue in overweight and obesity. This will require a thorough understanding of these issues in order prepare a useful presentation for non-specialists. For this you need to familiarise yourself with:

- The energy content of food and the energy requirement or maintaining body weight
- Glycaemic index
- The balanced plate – the ideal composition of a main meal
- How food components are metabolised
- How the metabolic pathways for carbohydrates, fats and proteins are interlinked
- Energy storage
- How hormones instruct the body what to do with the molecular components of digested food
- How and why fat is deposited and consumed.
- The effect of stored abdominal fat on metabolism

As your team begins to form a view of the type of content you want for your proposal letter, divide up the searches between the team members, each member being responsible for a defined aspect of the problem. Combine your findings for preparing the proposal letter, keeping in mind that your final presentation will reflect the scope you describe in the proposal letter

End of Student Resource for Proposal Letter and Presentation Preparation

Session 2 The Proposal Letter

The PowerPoint slide show **"Molecules in Metabolism"** is provided to tutors in the resource documentation to be presented by the tutor if it is felt that this aspect of the course needs a more didactic approach, since students are required to demonstrate some understanding of metabolic chemistry relevant to obesity.

After the teams have surveyed the informational resources given to them in Session 1 they are tasked with writing a letter to the local Education Authority proposing that they visit local schools to give presentations to senior pupils on the topic of overweight and obesity. An outline letter is provided ("Proposal Letter Model" as a handout). It should be made clear that the letter should describe the informational content that the teams plan for their presentations to schools. A deadline of four weeks is given for submission of the letters (to the tutor) either electronically or as hard copy. Teams are notified individually of their success or the need to resubmit, with guidance for any modifications seen as necessary.

Session 3 The Presentation

After appraisal of the proposal letters with feedback from the tutor, teams are tasked with the preparation of 20-minute illustrated PowerPoint talks suitable for their target audience of scientifically literate school children (16 -18 year-olds). A two-page flier should also be prepared by each team in as attractive a style as possible with the aim of advertising the talks to schools and of leaving behind a tangible reminder of their presentations. Once again the teams should be reminded that their presentations must be consistent with the proposal letters they submitted.

The following advice on preparation of the presentations is given in the Student Resources handout:

Student Resource "Preparing the presentation."

You now are to prepare a 20-minute PowerPoint presentation suitable for delivery to an audience of scientifically literate sixth-formers. Keep to the themes and goal you developed in the proposal letter that you submitted to the Education Authority Keep in mind the level of chemistry that you need in order to prepare the presentation you have outlined in your proposal letter. Keep in mind also the fact that you are preparing 20-minute talks. This limits the number of slides you can usefully include in the presentation to about ten. Make sure that your talk is appropriate for an audience of 16-18 year-olds who have some understanding of chemistry.

An introduction slide and a summary slide are important. A useful rule of thumb is "Tell them what you're going to tell them, then tell them, then tell them what you've told them".

Keep the amount of information on each slide to that needed for what you want to say – crowded slides are counterproductive as they make an audience tune out, especially in the age group you will be addressing. Plan on spending two minutes on each slide.

Avoid dark and complex "artistic backgrounds" – they might appeal to you but the audience wants to see clearly the information on the slide, not to be impressed with the background. Animations should be avoided unless you are an expert.

Practice transitioning between slides so you know what the next slide is going to say.

End of Student Resource "Preparing the presentation."

Student teams are assigned topics for practice presentations to be delivered in the next session. A practice session will be beneficial both for accustoming the students to necessary condensation of their data and to developing a structure for the talks. This will also prompt them to select a speaker for each team. Tutors should select some simple topics for five-minute presentations from each team held in front of the whole class. Tutors give advice on presentation techniques, as outlined in the Student Resources document that the students were given earlier in Session 1.

Session 4. Practice Presentations and Introducing the Report

Student teams will present short talks on topics assigned in the previous session. Feedback from students on practice presentations is to be encouraged, and from tutors as necessary. A date for the formal 20-minute presentations is announced and the format of the session explained. Teams will by then have prepared their pamphlets/fliers for distribution at the formal presentation session. Each student team will have selected their representative speaker, and it should be made clear that the assessment for the presentation will be of the entire team.

A date for the formal presentations is announced and the format of the presentation session explained. Teams are by then to have prepared their pamphlets/fliers for distribution at the formal presentation session. Each student team will have selected their representative speaker, and it should be made clear that the assessment for the presentation will be of the entire team.

The teams are now given the task of writing a 4-page report to cover the information content of their final presentations, with recommendations for alleviating the problem, and a two-page flier, with a deadline for submission. In giving advice on proposing policy recommendations, suggest some topics to make it clear that students should give free rein to their imagination. Examples could include:

- What do you think about the inclusion of fast food and soft drinks manufacturers in making government policy?" (http://www.guardian.co.uk/politics/2010/nov/12/mcdonalds-pepsico-help-health-policy)
- Should the exposure of children to junk food advertising in the media be limited?" (http://pediatrics.aappublications.org/content/early/2011/06/23/peds.2011-1066.full.pdf+html)
- Would taxation of fatty and sugary food help? http://www.guardian.co.uk/world/2011/oct/02/denmark-fat-tax-obesity
- Food labeling, food vending machines in schools, fast food shops near schools? http://www.theboltonnews.co.uk/news/9856455.Food_labelling_bid_to_fight_obesity_epidemic/

Session 5.The Final Presentations

Presentations should be advertised in your department to encourage students and staff from outside the course to attend. An audience unfamiliar with the topic will provide a useful question and answer session. Pamphlets/fliers prepared by the teams will be distributed to the audience before the session. Consider using contacts you might have with local schools to invite a schools audience if this does not present logistical difficulties. A wide-ranging audience will lend a reality component to what is the most important output of the course.

The room should be set up as for a departmental seminar with projection facilities, laser pointer and laptop. Water is provided for the speaker. Students are introduced to the audience by the tutor. Time limits should be strictly adhered to. Questions should be encouraged and prompted by the tutor if necessary with a cut-off after 5 minutes.

Assessment of the presentations and the question and answer session by other students is sought. A score-sheet can be handed out at the beginning of the session. A sample is provided in the resource documentation.

Assessment.

The suggested marking scheme is

Proposal letter	30%
Presentation and leaflet	60%
Report and flier	10%

The assessment of the presentation will incorporate marks given by the audience for the presentation. 50% of that mark will come from the audience assessment. An assessment form with assessment criteria is included in the resource documentation.

Self assessment by team members of the contribution by other group members will be taken into account in the final individual marks.

Time-Line

Tutor-led Session 1: Introducing the Resource

- PowerPoint slide show “Introduction”
- Assignment of students to teams (4-5)
- Passing out “The Brief” document to students
- PowerPoint slide show “Overview of the Obesity Crisis”
- Passing out “Student Resources” document.

Tutor-led Session 2: The Proposal Letter

- PowerPoint presentation “Molecules in Metabolism” if desirable.
- Discussion of the informational resources.
- Introduce the Proposal Letter and what it should contain.
- Hand out the “Proposal Letter Model”.
- Stipulate a four-week deadline for submission of the letter to the tutor.

Tutor-led Session 3: The Presentation

- Feedback on the Proposal Letters, with suggestions for improvement.
- Students tasked with preparing 20-minute presentations.
- Advice on presentation construction.
- Assigning of topics for 5-minute practice presentations

Tutor-led Session 4: Practice Presentations

- 5-minute practice presentations with discussion of technique
- Students are tasked with preparing a report on their analysis of the topic.
- Offer suggestions for policy issues.
- Tutors to advertise the presentation sessions and invite local schools to send groups.

Tutor-led Session 5. Delivery of Final Presentations

- Presentations and question-and-answer sessions.
- Distribution of assessment forms to the audience.

ASSESSMENT OF PRESENTATION

Presentation Title .....

Group Number .....

Presenter .....

Assessment

Structure of talk ...../10..
(was the theme clear and were the ideas developed logically)

Presentation Style ...../10..
(was the talk articulated clearly, did the speaker connect with the audience, eye contact)

Content of talk ...../10..
(was there a good balance between science and societal issues; was the talk consistent with the proposal)

Question and answer ...../10..
(did the speaker answer questions convincingly; were the answers expressed confidently)

Quality and impact of pamphlet ...../10..
(did the pamphlet give a good idea of the upcoming talk)

Total ...../50..

Are you a school visitor? y/n