

Tackling the Technology Gender Gap Together: **Healthy Choices- What's on your Plate?**

Level - Second Level

Subject area/s – Computing Science and Literacy



Healthy Choices Computing Science – What's On Your Plate?

Level - Second

Subject area/s – Technologies – Computing Science
Health and Wellbeing – Food and Health

Experiences and Outcomes –

- I understand the operation of a process and its outcome. I can structure related items of information. **TCH 2-13a**
- I can explain core programming language concepts in appropriate technical language. **TCH 2-14a**
- I can create, develop and evaluate computing solutions in response to a design challenge. **TCH 2-15a**

Benchmarks –

Understanding and analysing computing technology

- Identifies algorithms/instructions that include repeat groups of instructions a fixed number of times and/or loops until a condition is met.
- Uses a recognised set of instructions/algorithm to sort real worlds objects for examples, books in a library or trading cards

Understanding and analysing computing technology

- Explains the meaning of individual instructions (including variables and conditional repetition) in a visual programming language.
- Predicts what a complete program in a visual programming language will do when it runs, including how the properties of objects for example, position, direction and appearance change as the program runs through each instruction.

Designing, building and testing computing solutions

- Creates programs in a visual programming language including variables and conditional repetition.
- Identifies patterns in problem solving and reuses aspects of previous solutions appropriately for example, reuse code for a timer, score counter or controlling arrow keys.
- Identify any mismatches between the task description and the programmed solution, and indicate how to fix them.

Duration of time – 5 Hours

- 3 x 1.5 hr Lessons for Computing Science activities
- 2 x 1hr Lessons for Health and Wellbeing research

Computing Science Concepts and Approaches –

(Definitions from [Barefoot Computing](#) – Computational Thinking Resources.)

Concepts

Algorithms – Making steps and rules

Programming

Sequence

Patterns – Spotting and using similarities

Decomposition – Breaking down into parts

Selection

Variables

Evaluation – Making Judgements

Approaches

Creating – Designing and making

Debugging – Finding & fixing errors

Persevering – Keeping going

Resources required

- Demonstration of completed program outlined in plan can be viewed at <https://scratch.mit.edu/projects/150367430/> .
- Video is available on Glow and on [You Tube](#)
- What Is On Your Plate, Food For Thought Food Cards PDF
- What Is On Your Plate, Food For Thought Food Groups Identified by Colour Cards PDF
- <https://scratch.mit.edu>
- <http://barefootcas.org.uk>
- <https://education.gov.scot/improvement/Documents/HWBFoodHealthBenchmarkSPDF.pdf>
- <http://www.foodstandards.gov.scot/nutrition-healthy-eating/eating-healthily/eatwell-guide>
- <http://www.foodstandards.gov.scot>
- <http://www.nhs.uk/Livewell/goodfood/Pages/the-eatwell-guide.aspx>

Overview of learning

This lesson is based on learners extending and deepening their understanding of computing science via a visual programming language, in this case they should use Scratch.

Learners will also be gaining a greater awareness of food groups and how important having a balanced diet is whilst developing a knowledge of food labeling. This is part of a health and wellbeing activity which will provide the core learning, teaching and research opportunities which learners will need in order to complete their algorithm which will sort the foods into groups and make selections based upon the Eatwell Guide.

Using a games based model, learners will then design and build a challenge within Scratch where they must create an program to meet the 5-a-day fruit and vegetable recommendation and the 6-8 glasses of water a day guideline using loops, variables and conditions which encourage the participant playing their Food For Thought game.

In addition, learners will build their own program, enhance their understanding of positional and directional properties of objects with the game as will as debugging as they testing their solution.

Pupil Objectives

- I can create a simple program using algorithms, variables and conditions.
- I can identify food groups and link these to patterns using visual programming language.
- I can identify coordinates within my stage/ backdrop to correctly allow objects to move based on my understanding of food groups.
- I can debug my program and identify any mismatches between my challenge and the solution.

Introduction

Discuss the topic of Health and Wellbeing – Food Groups with learners. Explain that they will be required to research and learn about food labeling and groups in order to create a Food for Thought Computer Game which will encourage users to think about what foods they consume and to help them have a balanced diet.

Discuss that people have choices and that through the use of computing science and programming the learners will create their own version of an interactive game which encourages their peers to make positive, healthy food and drink choices. Demonstrate the example created to accomany this lesson plan which can be found at <https://scratch.mit.edu/projects/150367430/>



Prior to looking at the code used to create the game being demonstrated, ask learners to identify key components of the computing science activity which they will be required to build into their program e.g. loops, algorithms, counter. The viewing of this online example will also allow learners to identify their own prior knowledge with Technologies and Health and Wellbeing and what next steps in their learning they may have in both curricular areas.

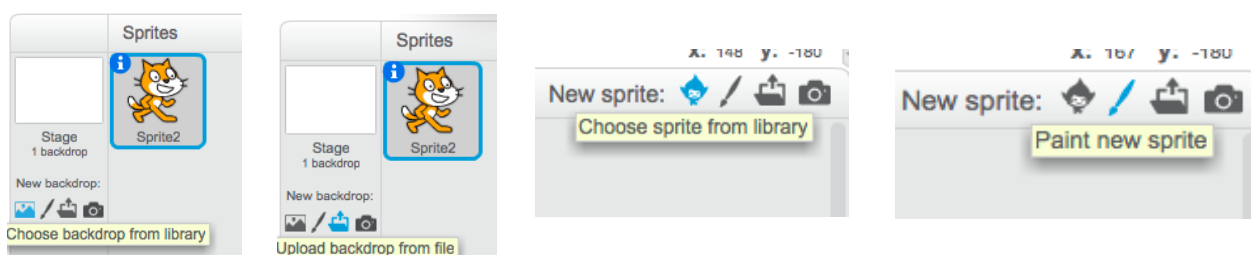
Main Activity

Learners should have the opportunity to investigate food groups and food labelling on packaging through a variety of active learning activities whilst carrying out research to deepen their knowledge of food groups and guidance on food and drinks.

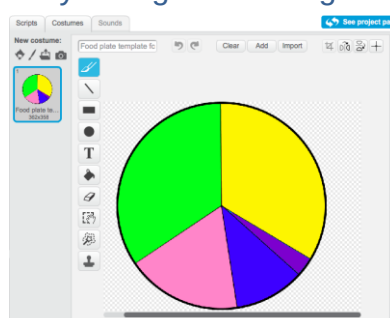
Using the What On My Plate, Food For Thought Card PDFs as one of your resources, learners should create a factfile on each food group, which will allow them to identify which products belong to each group, if any product has guidance e.g. fruit juice is a healthy choice but no more than 150ml in one day due to sugar content. This factfile will be used to guide them as they create their computing science activity and can be used as a form of assessment for the learning in Health and Wellbeing (HWB) which has taken place.

Having completed their research, learners will now create a game using Scratch, which will demonstrate their understanding of food groups.

Learners should create a **Stage** or **import** an existing one from the **backdrops** resources build into the program and they should then select a **sprite** to use as the main character in the game, alternatively they can amend an existing character or create a version of a character of their own design using the **costume**.



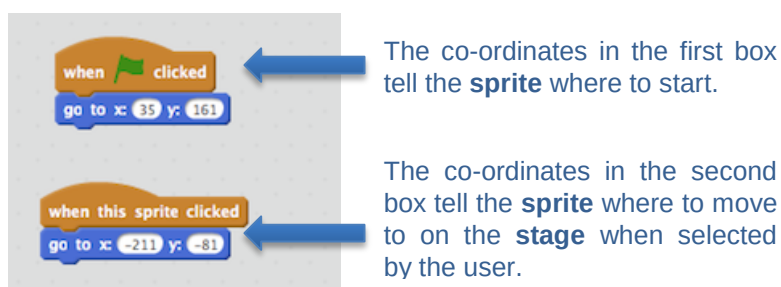
Learners should now create a food plate, based around their understanding of the Eatwell Guide using the **paint new sprite** tool. If importing a copyright free image of this plate, learners can remove any background using the **erase** button.



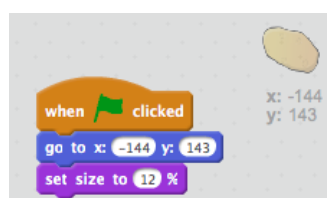
Recap using the learners' factfiles to identify the sorts of food which learners should use as **sprites**. They will create an **algorithm** to identify which food group each item belongs to, this may can be done by creating an **unplugged** copy of each **algorithm** they use in their profile as this is a guide for life not just their **program**.

Learners should now add a **sprite** for an item either by drawing it, sourcing it from the internet following usage rules of any images they select or alternatively, teachers can provide them with images included in this resource pack. Once each **sprite** is added learners will use the **coding blocks** to build up their **algorithm** in the **script** area at the right of the screen.

Scratch will require the learner to identify and use the **x-y coordinates** of where they want their food **sprite** to start and where on the Eatwell Plate it should finish to correctly identify it's food group. They should use the mouse to identify these **coordinates** and include them in the algorithm for each food item which is shown as a **sprite**.



As learners add items they will identify that the sizing of objects may be too large or too small. To build on their knowledge of using the **costume** area to stretch or shrink an object size, learners should develop the range of code blocks they are using by selecting the '**set size**' block linking this their work in numeracy and mathematics.



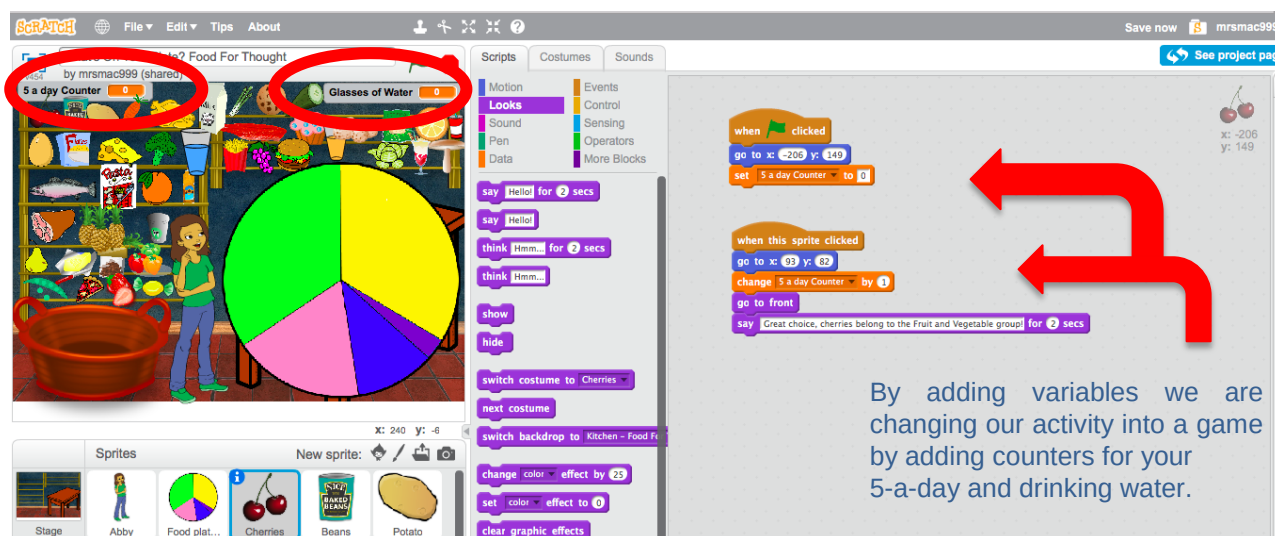
Encourage learners to identify the **pattern** and **decomposition** within their **algorithm** as this process is repeated for all food and drink items being used as **sprites**. A separate area on the stage should be identified for the learners to move the high fat, salt and sugar group items to and learners should now start to add in **code blocks** from the '**looks**' script.

Adding this additional text will reinforce the HWB learning whilst allowing the learners voice to be heard as they communicate the message in their own style whilst encouraging a broadening of the **visual coding language** used. Learners should also be encouraged to add in these '**look**' scripts into other food groups.



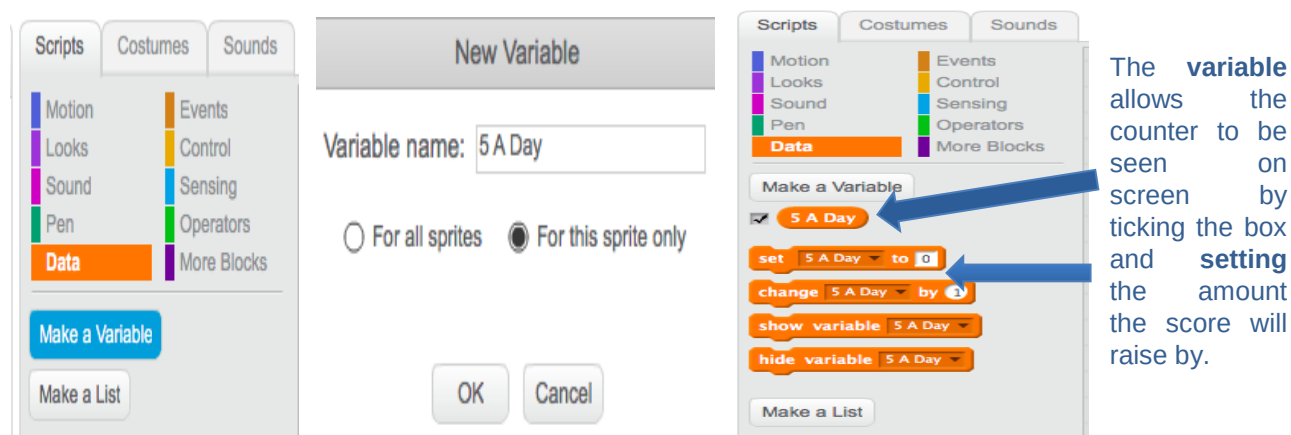
It is important for learners to **debug** their program as they build it, removing any erroneous code and amending any glitches before saving their work at regular intervals.

To ensure that learners are identifying that it is important to have a balanced diet, learners should now add their 5-a-day fruit and vegetable counter as well as a counter for glasses of water to remind them to drink between 6-8 glasses each day, to do this the learners will add **variables** to add up each of these healthy options.



Explain to the learners that a **variable** is like a box or container which they can create to store any **data** (information) such as numbers or words, for this game we will be storing numbers to count our virtual intake of fruit, vegetables and glasses of water. Discuss where variables, such as the ones shown in the example activity, can also be found or used e.g. scores of football games, displaying life/health within computer games, timers for activities, etc. and why these are useful.

Learners will be required to add their own **variables** via the **data** script. They will need two **variables** for this activity but can extend and deepen their understanding of this **concept** by investigating how else it can enhance the experience for the user of their game e.g. adding a timer variable.

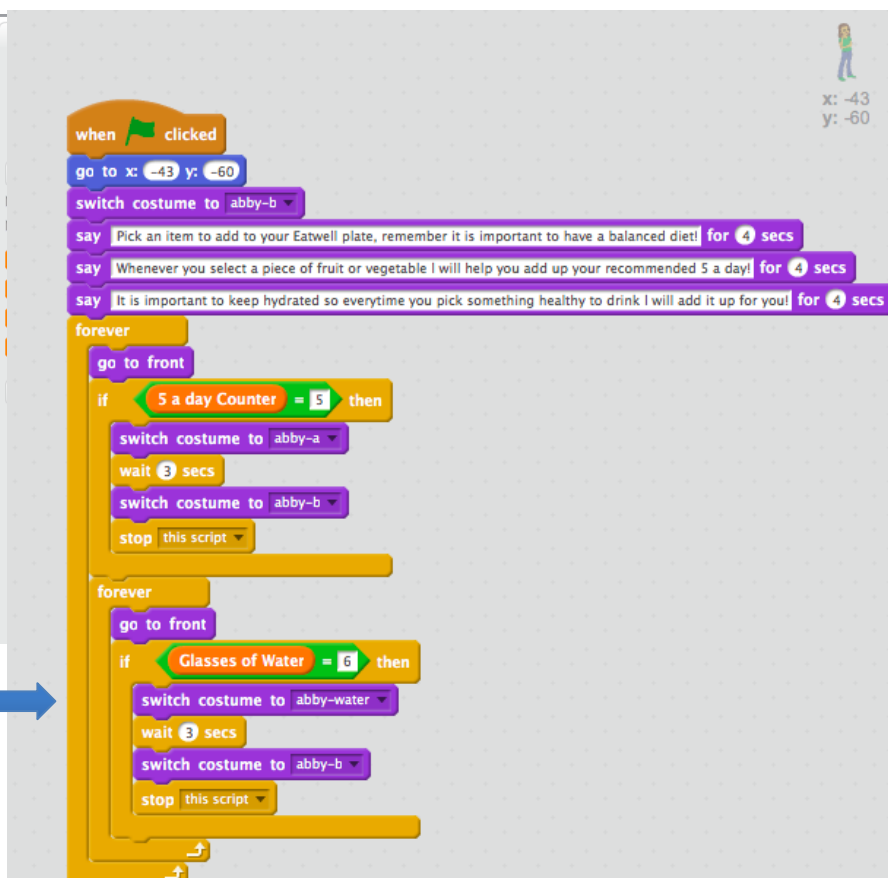


It is important to point out that what they name their **variable** in the **New Variable** pop up window will determine the name it is found by in the **code blocks**.

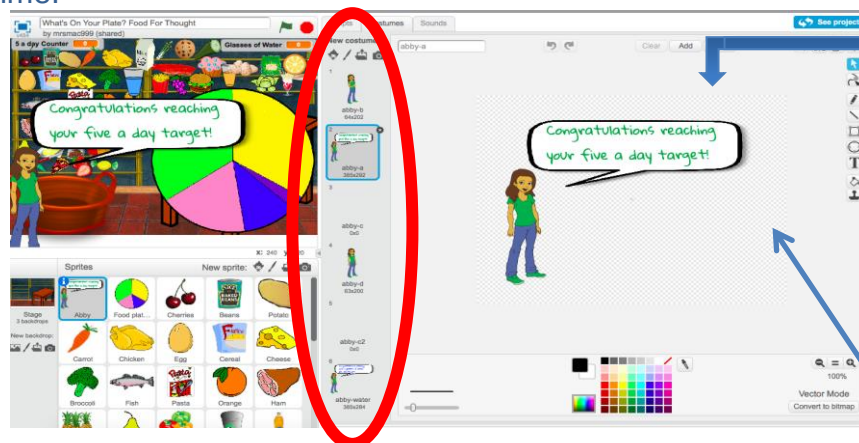
Learners should review how the main **sprite**, representing the player, introduced the game requirements and key learning points in Health and Wellbeing. This can be done by selecting the sprite and adding lines of **code** from the 'looks' script that act as guides.



Using **loops** ensures that when the player reaches their healthy eating and drinking goal they can be rewarded with a congratulatory message.



Learners should also add **forever loops** at this stage. This will ensure that if a player reaches the required target number identified in the Eatwell Guide they can be given a message or can change the background. The learners will be required to also add **conditional loops** of **if / then**, these **loops** will make your **code** more efficient and reduce the number of **blocks of code** your are putting into your **script**. In this case this, the computer is always looking for the player to achieve a set number which we are adding up with the **variables** we added to some of our **sprites**. If the player achieves that number then the main **sprite** can change their **costume** to include a message for a set amount of time.



These tools will allow you to draw or type any additional messages. Learners can also add a sprite or import one from the internet.

Plenary

At the end of each **Computing Science** lesson discuss with the learners;

- which of the **concepts** and **approaches** they have used and what impact that had on their work?
- did anyone have to make changes to their original **algorithm**? If so, how and why?
- what was their criteria for **decomposition** when looking at food groups and labels?
- ask learners to identify further real world applications for **programs** similar to this and use these to develop extension activities and challenges for future learning.
- did any learner find any issues when they were **debugging** their **program**, if so how did they resolve this?

Differentiation

Learners can be encouraged to design as many of the stage **backdrops** and **sprites** as possible and develop their understanding of the **design process** and **vector images**.

Learners experiences can be extended by asking learners to add different **variables** of their choice into the **program** e.g. timers. This project could also be extended by asking learners to change how each item moves onto the plate by using alternative '**motion**' **code blocks** e.g. **glide**.

Learners who are more able can also create their own blocks which would allow learners to create additional algorithms when used in conjunction with **loops**, **sense** or **data coding blocks**.

Learners could be asked to sort food using different criteria / **algorithms**.

Assessment Opportunities

- Reviewing and discussion of learners understanding of each food group and the ratio at which it should be consumed to stay healthy and have a balanced diet.
- Observe and review if learners have created a successful algorithm using unplugged and plugged methods. This work can be evidenced with either photographs and screenshots.
- Learners to create factfiles on HWB and CS concepts that they have been learning. These should be used to compile a Say, Make, Do, Look display ensuring that their voice is heard and that they can explain, in their own terms, the variables and conditionals being using in their program.
- The completed program and accurate movement of sprites within it will demonstrate that a learner understands how the x-y axis of the stage works and that they can successfully interpret this information.

Curriculum Links

Health and Wellbeing - Food and health

- By applying my knowledge and understanding of current healthy eating advice I can contribute to a healthy eating plan. **HWB 2-30a**
- By investigating food labelling systems, I can begin to understand how to use them to make healthy food choices. **HWB 2-36a**

Numeracy – Information Handling Data and Analysis

- Having discussed the variety of ways and range of media used to present data, I can interpret and draw conclusions from the information displayed, recognising that the presentation may be misleading. **MNU 2-20a**

Numeracy – Shape, Position and Movement (Angle, Symmetry and Transformation)

- I can use my knowledge of the coordinate system to plot and describe the location of a point on a grid. **MTH 2-18a**