

## Healthy Diet Lesson Plan

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Contributors: Ayşe Hilal Yıldız, Derya Baburşah, Dr. Zeynep Şen, Gizem Güzeller, Emre Can Çil, Mehmet Demir, Melike Nur Köroğlu, Muhammed Emin Ayaz, Selen Galiç, Volkan Uluçınar,

<b>Integration</b>	<b>21st Century Theme: Health Literacy</b>		
	<b>Disciplinary Concepts</b>	<b>Mathematics</b> Fractions	<b>Science Education</b> Nutrient types
		<b>Technology</b> Use of word processing software	<b>Art</b> The importance of a healthy nutrition in sports
	<b>Prerequisite Knowledge</b>		
	<b>Learning Outcomes for Mathematics</b>		
	<ul style="list-style-type: none"> <li>• Students are able to use different ways of demonstrations to present the data they obtain.</li> </ul>		
	<b>Learning Outcomes for Science Education</b>		
	<ul style="list-style-type: none"> <li>• Students are able to explain the relationship between organism life and nutrient content.                             <ol style="list-style-type: none"> <li>a. Without introducing the detailed structures of proteins, carbohydrates, fats, vitamins, water and minerals, their importance is emphasized only.</li> <li>b. Vitamin types are not emphasized.</li> </ol> </li> <li>• Students are able to explain the relationship between organism life and nutrient ingredient.                             <ol style="list-style-type: none"> <li>a. Without introducing the detailed structures of proteins, carbohydrates, fats, vitamins, water and minerals, their importance is emphasized only.</li> <li>b. Vitamin types are not emphasized.</li> </ol> </li> <li>• Students are able to deduce that water and minerals are found in all types of foods.</li> </ul>		
	<b>Learning Outcomes for Information Technologies</b>		
	<ul style="list-style-type: none"> <li>• Students are able to realize that computers can be used for various purposes.</li> <li>• Students are able to use multimedia resources for learning purposes.</li> <li>• Students are able to list what needs to be done to use information technology tools safely.</li> <li>• Students are able to recognize the ethical rules to be followed while using the internet.</li> <li>• Students are able to realize that there are different multimedia contents on the Internet.</li> </ul>		
<b>Learning Outcomes</b>			
<p><b>Grade Level:</b> 4th grade  <b>Duration:</b> 14 lesson hours</p>			
<b>Mathematics</b>			
<ul style="list-style-type: none"> <li>• Students are able to formulate a specified proper fraction of a quantity.                             <ol style="list-style-type: none"> <li>a. The process of formulating a specified proper fraction of a quantity starts with models, then the teacher has the students do the operations.</li> </ol> </li> </ul>			
<b>Science Education</b>			
<ul style="list-style-type: none"> <li>• Students are able to discuss the importance of freshness and naturalness of foods for a healthy life based on research data.  <i>Concepts such as frozen foods, packaged foods, and expiration dates are emphasized. Additionally, students' attention is drawn to the cleanliness of the foods.</i></li> <li>• Students are able to establish relationships between a balanced diet and human health.  <i>The relationship between obesity and eating habits is emphasized. The teachers draw attention to the prevention of food waste.</i></li> </ul>			
<b>Information Technologies</b>			
<ul style="list-style-type: none"> <li>• Students are able to explain the software required to use the Internet.</li> <li>• Students are able to realize that there are different multimedia contents on the Internet.</li> <li>• Students are able to use information technology tools to do research.</li> <li>• Students are able to do research at a simple level on the Internet.</li> <li>• Students are able to discover that they can reach different multimedia content during the research process.</li> <li>• Students are able to organize the data according to its properties.</li> </ul>			

	<ul style="list-style-type: none"> <li>Students are able to visualize the data they collect.</li> </ul> <p><b>Visual Arts</b></p> <ul style="list-style-type: none"> <li>Students are able to gain the eating habits of a sufficient and balanced diet while participating in sports and physical activities.</li> </ul>
	<p><b>Problem Situation</b></p> <p>The prevalence of obesity is increasing day by day in our country, similar to the other countries in the world. According to the preliminary study report of the “Turkey Nutrition and Health Research” conducted by our Ministry in 2010, the prevalence of obesity in Turkey was found as follows;</p> <ul style="list-style-type: none"> <li>20.5%, for men</li> <li>41.0%, for women</li> <li>30.3%, in total</li> </ul> <p>In this context, it is important for individuals to learn about what they should be careful in order to have a healthy nutrition. Within the scope of this lesson plan, it is planned to increase the awareness of students about a healthy nutrition. The main problem, hence, is “What should I pay attention to for a healthy diet?”</p>
	<p><b>Materials</b></p> <p>Appendix 1, Appendix 2, Appendix 3, Appendix 4, Microsoft Office Word software or a similar word processing software, GeoGebra file, smartboard, pen, paper, computer or tablet for students, post-it notes</p>
Real World Context	<p><b>Preparation for the lesson</b></p> <p>During the preparation of the lesson plan, teachers should do research to seek answers for the following questions:</p> <ul style="list-style-type: none"> <li>Why do we need food?</li> <li>What are the functions of food?</li> <li>What are the food sources?</li> <li>What is the amount of food to be consumed?</li> <li>How is fraction defined?</li> <li>What are the equal-sized parts and the whole relationship?</li> <li>How to use GeoGebra? What does the slider do?</li> <li>What are word processing softwares?</li> <li>How to take a screenshot?</li> </ul>
	<p><b>Resources</b></p> <p><a href="https://www.eba.gov.tr/">https://www.eba.gov.tr/</a>  <a href="https://www.freepik.com/">https://www.freepik.com/</a>  <a href="https://www.nationalgeographic.com/what-the-world-eats/">https://www.nationalgeographic.com/what-the-world-eats/</a>  <a href="https://phet.colorado.edu/sims/html/fractions-intro/latest/fractions-intro_en.html">https://phet.colorado.edu/sims/html/fractions-intro/latest/fractions-intro_en.html</a>  <a href="https://www.geogebra.org/m/vriq5jab">https://www.geogebra.org/m/vriq5jab</a>  <a href="https://www.youtube.com/">https://www.youtube.com/</a></p> <p>This lesson plan is conducted within the “STEAM-BOX: Courses, Tools, Resources for Teachers (2020-1-HU01-KA201-078743)” project which has been funded by the Erasmus+ program of the European Union. The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.</p>
STEAM Activity	<p><b>Ask</b></p> <p>The lesson begins by watching an interesting video. The video gives students an idea of why a healthy life is important. Before the video, teacher say the students that they will watch a video and take notes by thinking about the following questions while watching the video:</p> <ul style="list-style-type: none"> <li>What is the message of the video?</li> <li>What contents caught your attention in the video?</li> </ul> <p>Then, the students watch the video provided with a link ( <a href="#">THE CHOICE ( Short ) Animated Movie</a> ). After watching the video, students are given a few minutes to edit their notes. By creating a discussion environment in the classroom, students are encouraged to share their ideas. At this stage, the following questions can be asked to the students during the class discussion:</p> <ul style="list-style-type: none"> <li>Why do we eat?</li> </ul>

- What do you eat in your daily life?
- How do the nutrients we consume help our bodies?
- How many days can we survive without drinking water?
- Why do we consume different nutrients during the day?
- Which of the foods you saw in this video do you consume?

The answers from the students are written on the post-it notes and stuck on the board. After all the answers have been shared, the teacher asks the students which of the foods written on the post-it notes can be on the left side of the video and which ones they have seen can be on the right side of the video. Post-it notes are categorized on the board. Based on the answers from the students, possible categorizations may be as follows:

1. Categorization (individual on the left side in the video): Coke, hamburger, chocolate, jelly beans, etc.

2. Categorization (Individual on the right side in the video): Broccoli, carrots, tomatoes, lettuce, etc.

### Research

A discussion setting among the students is created to find a name for the aforementioned categorizations. It is expected that the 1st categorization will be titled "unhealthy foods" and the 2nd categorization will be titled "healthy foods" (Titles may vary according to the class discussion). Students are asked about what they eat for a week and they are asked to take notes of what they eat during this week. In order for the students to take notes regularly for a week, the teacher hands out a worksheet named **Appendix 1. Weekly Tracking Chart** for each student. (A sample table that is expected from the students is provided in the file named **Appendix 2. Sample Weekly Chart**. This document was prepared as a sample for teachers).

During this week, the teacher introduces the types of nutrients in the unit (protein, carbohydrate, fat, vitamins, minerals and liquids), while students do research about the foods they consume. The teacher also shares the information pack included in the materials named **Appendix 3. Nutrients and Their Properties** with the students.

Class discussions are held by watching the videos in relation to the nutrient types using the links provided below. These videos can also be used for categorizing the foods based on the nutrient ingredients.

[balanced diet | #aumsum #kids #science #education #children](#)  
[Nutrition facts Labels - How to Read - For Kids - Dr. smarty](#)

After doing the research about the nutrients they consume for a week, the teacher groups the students as three or four and ask them to compare the foods they consume in their groups. During the comparison, students are asked to answer the following questions:

- Have all types of nutrients been consumed?
- Have you paid attention to the nutrients that should be consumed at different meals?
- Are healthy or unhealthy nutrients consumed more?

After the group discussion, a class discussion is held about what the world eats. The teacher shares the contents of the link and website via the help of the smartboard and all the students examine the contents. It is also possible to examine the charts of different countries on the website. (Click to access the website-> [What the World Eats | National Geographic](#)).

A class discussion is held about how the amounts of consumed nutrients can differ among individuals or among meals. The teacher directs the following questions to the students:

- How much protein should we consume in a meal?
- How can we decide on the distribution of nutrients according to their amount?
- How can we know the distribution of nutrient types when the amount of a meal changes?
- How can we use representations when expressing nutrient quantities?
- How can we represent the parts of a whole?

With these questions, students are expected to remember the use of fractions. At this level, fraction should be taught as the relationship between equal-sized parts and whole. The use of materials is supported with technology so that the students can understand the use of fractions and the relationship between equal-sized parts and the whole. Students are asked to represent fractions with the simulation in the link. (Click for the link -> [https://phet.colorado.edu/sims/html/fractions-intro/latest/fractions-intro\\_en.html](https://phet.colorado.edu/sims/html/fractions-intro/latest/fractions-intro_en.html))

Thanks to this simulation, students will not have misunderstandings about the concepts by slicing the circle represented by the plate into equal parts. In addition, the simulation will create the mathematical basis for the students to solve the problem via a daily-life sample of "cake on the plate".

The simulation consists of three parts: introduction, game and laboratory. The teacher explains the equal parts-whole relationship using different representations by conducting the intro part with the students in the classroom. Following the explanations, the teacher asks each student to represent the fractions given in the game section individually (They are expected to create the fractions given on the right side of the game screen by using visual representations in the middle of the screen). The prepared visual representations are brought over the fractions via the drag-and-drop method. If the result

	<p>is correct, the visual representation stays on top of the fraction; otherwise, it automatically returns to the part where the visual representation was firstly created). The number of examples to be practiced here may vary depending on the grade and the level of mathematical knowledge of the students. Finally, the students play the laboratory (lab) part of the game in pairs. One of the students says the fraction, the other group member visualizes the fraction being said. They discuss whether it's true or not. If correct, the other group member takes the turn to do the same.</p> <p><b>Imagine</b> The teacher creates groups of four or five students and provides each group with a worksheet named “<b>Appendix 4. What Should Be on My Plate?</b>” Students, then, are asked to create a report in the digital environment and to plan what they should be careful about while creating the report. At this stage, students who want to use phet simulation are given the opportunity to do so. The teacher asks the students to discuss what they should be careful about in their group work. If needed, the teacher also emphasizes that when using the fractions, they should pay attention to the equal-sized parts and whole relationships. To this end, when students are presented with a circle shape, they are evoked by an awareness of how to draw equal-sized parts.</p> <p><b>Plan</b> A web application (<a href="https://www.geogebra.org/classic/vrjq5jab">https://www.geogebra.org/classic/vrjq5jab</a>) is used to represent the students’ use of fractions in their groups regarding the nutrients they will create on their plates. While using the application, the students are asked detailed questions about the nutrient sections that they will create on the plate.</p> <ul style="list-style-type: none"> <li>• How much of the whole plate should represent protein?</li> <li>• How much of the whole plate should represent fat?</li> <li>• Which nutrient type should be on the plate more?</li> <li>• What could be the examples of nutrient types?</li> <li>• What are the nutrient types that should be at lunch?</li> <li>• Should there be water on the plate? <i>The teacher emphasizes the amount of water that each individual should consume in a meal. The teacher ensures that students pay attention to their use of liquids.</i></li> </ul> <p><b>Create</b> The groups create representations of the meals they will create for lunch via GeoGebra. The screen shot of the fraction representation demonstrating the plate created by the students is attached to the Word file and the students are asked to prepare a report. In this report, they explain what fraction of the visual representation correspond to the identified nutrient groups and why they have made such a decision.</p> <p><b>Test</b> The reports are presented by the spokesperson from each group. It is ensured whether the representation of the distribution of nutrient types that should be included in the lunch includes carbohydrate, fat, protein, vitamin, and water. In order to check whether the nutrient group distributions of the meals are balanced or not, a comparison is made based on fractions of nutrient groups defined and how they decided.</p> <p><b>Improve</b> Students are given time to arrange the distribution on their plates as a result of the class discussion. Teacher prints out the documents prepared and hangs them on different parts of the classroom or school to create awareness.</p>
<b>Materials</b>	<p>A file named “<b>Weekly Tracking Chart</b>” will be handed out in the research phase for each student to regularly note what they consume for a week.</p> <p>A worksheet named “<b>What Have I Eaten for One Week</b>” has been added as a sample template for teachers. Students will be asked to write down the foods they consume for a week and take notes on the table.</p> <p>The presentation named <b>Nutrients and Their Properties</b> contains the information that students need to learn about the types of nutrients (protein, carbohydrate, fat, vitamin, mineral and liquids) during the research.</p> <p>The activity sheet named “<b>What should be on my plate?</b>” should be handed out for each group. The problem situation that the students will solve in the Create phase is included in this activity sheet.</p>
<b>Test</b>	<p><i>This part will be completed by the teacher after the lesson plan is implemented in the classroom.</i></p>
<b>Improve</b>	<p><i>This part will be completed by the teacher after the lesson plan is implemented in the classroom.</i></p>

Appendix 1. Weekly Tracking Chart



	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
MORNING							
SNACK							
NOON							
SNACK							
EVENING							
EXTRA							



**Appendix 2. What Have I Eaten for a Week?**

	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>	<b>Sunday</b>
<b>Morning</b>	Egg(P) Cheese(P) Olive(Y) Cucumber Tomato Bread (F) Milk(P)	French Fries (F,Y) Tomato Tea Cheese (P)	Omelet (P) Cheese (P) Olive(Y) Bread(K) Chocolate	Menemen Cheese(P) Egg(P) Bread Chocolate	Egg Salad(P) Cheese(P) Milk(P)	Mixed Toast(P,K) Tea	Piti (K) Jam Chocolate
<b>Snack</b>	Fruit	Dry fruit	Cake Biscuit	Chocolate Ice cream	chips Chocolate	Fruit	Wafer Milk
<b>Noon</b>	Pasta(F) Salad Meatball(P)	Rice(F) Salad Bean meal	Fruit	Pasta(F)	Noodle(N) Sausage Toast (P) Fruit juice	Hamburger (K,P,Y) Ayran (P)	Pizza(F,Y) Cola
<b>Snack</b>	Wafer	Chocolate	Biscuit Chocolate	Chocolate	Pop Cake	2xchocolate Cola Chips	Chocolate
<b>Evening</b>	Soup Rice Salad	Spinach Rice Yogurt	Rice Salad	chips Easy	Soup Eggplant Meal	Dessert with Sorbet	-
<b>Extra</b>						Nuts	
P: Protein K: Carbs A: Oil V: Vitamin M: Mineral							

### Appendix 3. Nutrients and Their Properties

#### Nutrients

We need energy to survive and to perform many activities such as walking and running. We get this energy from the nutrients we eat. Nutrients are also necessary for growth, development and repair of wounds in our bodies.

#### Categorization of Nutrients

##### 1. Foods by Source

Nutrients are obtained from plants and animals. The ones obtained from plants such as cereals, fruits and vegetables are plant-based nutrients; the ones obtained from animals such as meat, milk, eggs and fish are animal-based nutrients.

Plant- Based Nutrients



Animal-Based Nutrients



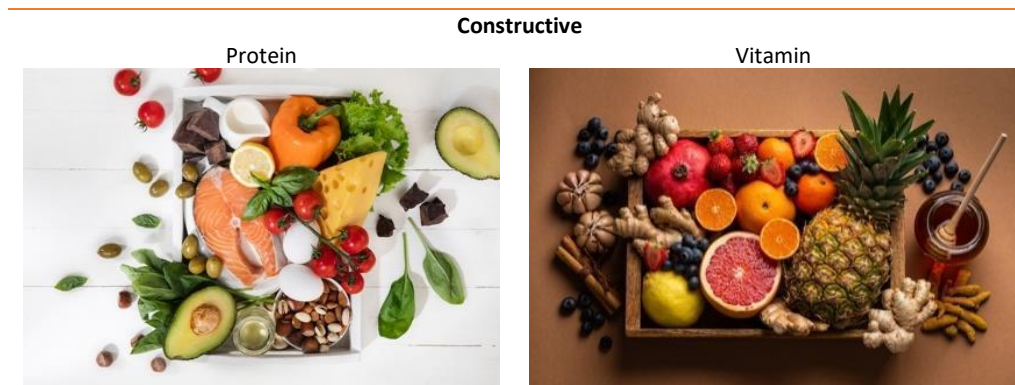
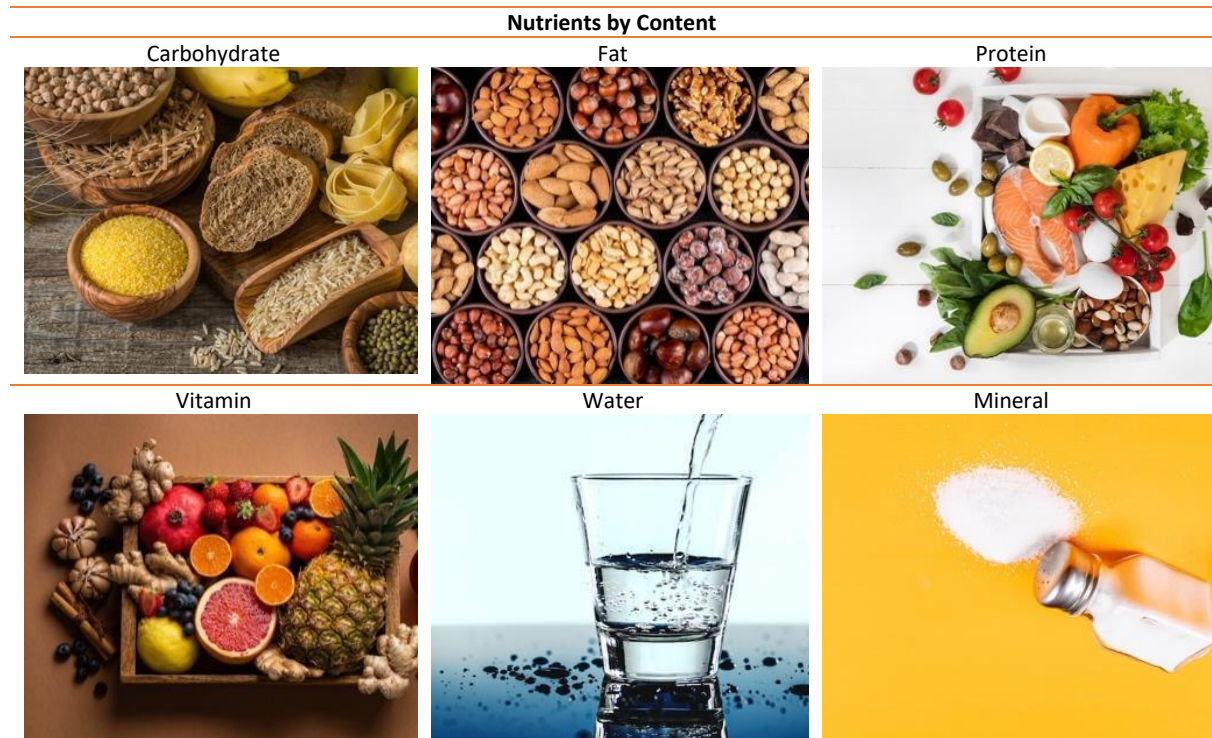
Nutrients according to their Roles in Our Body: According to their functions in our body; nutrients are categorized as energizing, constructive-repairing and regulatory. Foods responsible for meeting our energy needs are energy-giving nutrients. The foods that enable us to grow and heal our wounds are constructive - restorative nutrients. The nutrients that increase the resistance of our body and are responsible for the regular functioning of the organs and structures in our body are regulatory nutrients.





## 2. Nutrients by Ingredients

The nutrients in the foods are categorized as carbohydrates, fats, proteins, vitamins, water and minerals according to their ingredients. Foods may have more than one type of nutrients, but this categorization is made according to the nutrient that is most abundant in the structures of the foods. For example, almonds contain carbohydrates, proteins, fats, water and even small amounts of vitamins and minerals. However, almonds are categorized as fat-rich foods because they contain fat the most.







### Nutrient Types

**Water and Minerals:** Three-quarters of our body is water. We can live for weeks without food, but only a few days without water. Like water, minerals are essential nutrients for our life. Water and minerals are found in all foods and regulate vital activities.

### Freshness and Naturalness of Foods

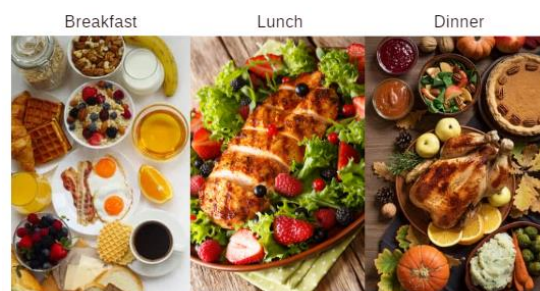
In the past, methods such as sun drying, canning and salting were used to keep foods intact for a long time. Today, with the development of technology, methods such as packaging, freezing and adding additives have been developed for this purpose. The use of these methods has also increased the variety of foods. However, since foods with additives are harmful to our health, we should not consume such foods too much.

### Balanced diet

Each type of nutrients has a different function in our body. For this reason, we need to consume all kinds of nutrients as much as our body needs. Consuming all the nutrients based on our body's needs in order to sustain our life in a healthy way is called balanced nutrition or diet.

In our daily eating habits, we should include the following different nutrients for a balanced nutrition;

- Bread, rice and pasta, which provide our body's energy needs,
- Vegetables and fruits which are rich in terms of water, vitamin and mineral,
- milk, yoghurt and cheese products which are rich in calcium,
- meat, eggs, legumes and some roasted nuts, oils, sweets and sugars that provide growth and development.



The types of foods that we should consume the most in our daily diet are bread, rice, pasta, vegetables and fruits. The types of foods that we should consume the least are butter and sweets.

In recent years, unbalanced and excessive diets in relation to changing food habits cause a health problem called obesity. Obesity is defined by the World Health Organization as excessive fat accumulation in the body to the extent that it impairs health. In addition to unbalanced and excessive diets, the inadequacy of physical movements and hereditary predispositions are also important factors that cause obesity. Throwing the foods away without being consumed is called food waste. The following important points should be done to prevent food waste;

- The shopping should be done in a planned manner and the foods that can be consumed in a short time should be bought.
- Bread is one of the most wasted foods. More bread than needed should not be bought; Stale breads should be toasted or fried in the oven.
- Appropriate storage methods should be utilized to be able to use the foods, that are not consumed, for a later time.
- Jam, pickles or tomato paste should be prepared from fruits and vegetables that are surplus of consumption.

#### Appendix 4. What Should Be on My Plate?

According to a study conducted by the United Nations Environment Program, it has been announced that 931 million tons of food is wasted in a year worldwide. This amount corresponds to 23 million truckloads of food weighing 40 tons. The length of that many trucks is seven times the circumference of the earth. The experts have warned that the works to prevent food waste should be given importance. A food company wants to calculate the amount of food that should be consumed by a student in one meal to prevent food waste in a meal list prepared for students. As a food engineer working for this company, you are asked to identify the types of foods that should be on a plate. You are expected to present a model that represents how much of different nutrient types should make up the plate so that the amount of nutrients can be adjusted for the lunch in a balanced way.

Write the types of nutrients that should be on the plate given below. Show how much of these nutrients should be included on the plate suggested in the visual. The food company expects you to write a report explaining why you wrote the types of nutrients in the model you created, your examples of the types of nutrients, and what you paid attention to when determining the proportions.

