

How can we live smarter?

6 Fighting hunger

Objective

In this activity students learn about the fight against world hunger and make their own nutrition bar (using Plumpy'Nut as a case study). They can experiment with the ratios to make a nutritious and energy-rich recipe which can be tested using calorimetry.

TOPIC LINKS

🔗 Design and technology: food technology, design considerations

ESSENTIAL SKILLS SUPPORTED

Problem solving, staying positive, teamwork

TIME

🕒 60 minutes

RESOURCES AND PREPARATION

- a range of nutrient-rich / high calorie foods, e.g. powdered milk, cooked brown rice, honey, raisins, dried fruit, e.g. dates, shredded coconut
- measuring cups
- electric balance
- spoons
- bowls

HEALTH AND SAFETY:

A suitable risk assessment must be carried out by the activity leader and any significant findings recorded: if carried out in schools, guidance from CLEAPSS or SSERC must be used where appropriate.

Make sure you are aware of any allergies before deciding which food items to bring. Nuts and nut products are banned in many schools.

Only allow students to taste their products if they are in a food safe environment (e.g. a food technology lab). Alternatively focus on the nutrient and energy content of the product, rather than the taste.

If there is not enough time/equipment/supervision, turn this into a demonstration and have the students calculate which group produced the most energy-rich paste for a pre-determined weight of the paste.

DELIVERY

- 1 Introduce the topic. In 2014, the second goal of the seventeen Sustainable Development Goals set up by the UN General Assembly was to work towards ending world hunger by 2030. Between 2014-2016, one in nine people were suffering from chronic undernourishment.
- 2 What does malnutrition look like? People with malnutrition lack the nutrients (carbohydrates, proteins, fats, minerals, vitamins – these could be introduced using the nutrition labels on different food items) necessary for their bodies to grow and stay healthy.
- 3 Ask students if they can name any effects of malnutrition and get a brief discussion going.
- 4 Food does not only provide nutrients, but also energy (go back to the nutrition label as students have likely heard of calories, but might not know what it stands for). Demonstrate how calorimetry can be used to determine the energy inside food (see BBC bitesize link in the Useful links below).
- 5 Ask if the students can think of any solutions to the problem of malnutrition.
- 6 The fight against malnutrition has been going on for a long time, but recently there was a breakthrough when Plumpy'Nut was introduced. Plumpy'Nut is used as a treatment for emergency malnutrition cases. It is cheap and high in protein. (See Useful link for more information.)

TIPS

- This could be a messy activity so prepare plenty of paper towels.



- 7 Explain to students that they are going to make their own version of Plumpy'Nut. It will need to include a good mix of nutrients and be easy to transport and store for long periods. While Plumpy'Nut is specifically for severe malnutrition, they might want to create something with wider appeal, such as a food supplement for athletes, or a nutritious and portable food for camping, hiking, or even for astronauts going into space!
- 8 Support students as they make their product.
- 9 Once they have finished, ask them the following questions:
- 10 What other nutrients are required in a healthy diets? Are these present in your paste?
- 11 How many calories are there in 100 grams of your paste?
- 12 Other than by checking from the nutritional labels of your ingredients, how could you test how much energy there is in your paste compared to the products from other groups?

DIFFERENTIATION IDEAS

Support: offer advice about the quantities of ingredients.

Challenge: allow fast finishers to consider how they could test the energy content in their food (in terms of calories). If the equipment and supervision is appropriate, let the students find the answer to that question using calorimetry (see BBC bitesize link in the Useful links below).

EXTENSION IDEAS

- 1 This topic could be linked to other causes of world hunger and possible solutions. One option is the food that is thrown away and wasted (e.g. at home, but also at stores). Let the students think of possible solutions.

USEFUL LINKS

- Information about Plumpy'Nut
www.nutriset.fr/products/en/plumpy-nut
- Sustainable development knowledge platform: SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture
<https://sustainabledevelopment.un.org/sdg2>
- The Guardian: Eight ways to solve world malnutrition
www.theguardian.com/global-development/2013/jun/08/eight-ways-solve-world-hunger
- Teens Health: Hunger and malnutrition
<http://kidshealth.org/en/teens/hunger.html>

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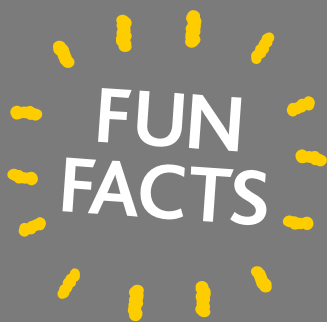
Your challenge

While the world produces enough food to feed everyone, many third world countries are suffering from hunger and malnutrition. One amazing solution is Plumpy'Nut – a peanut-based paste that is cheap, easy to make and designed to give malnourished people the nutrients they require.

YOUR TASK Make your own version of Plumpy'Nut and find out how sometimes, the best solutions can be the simplest!

WHAT YOU NEED TO DO

- 1 Select the ingredients that you want to use for your highly nutritious food. For each of the ingredients, carefully check the nutrition label on the packet (or research this on the internet) and write this down in the table below.
- 2 Use the electric balance to measure the amounts of each ingredient. Write the information down in the table.
- 3 Mix all your ingredients together into a thick paste. Keep adding ingredients if you are unhappy with the consistency, but make sure to weigh and record everything you add.
- 4 Check with your teacher if your version of the paste is acceptable.



- 1 Plumpy'Nut was made by French scientists at the company Nutriset.
- 2 Plumpy'Nut was initially inspired by a jar of Nutella.
- 3 The creators of Plumpy'Nut wanted to give their nutritious food an English name. They started with "pump", then "plump", then finally decided on Plumpy'nut.
- 4 A calorimeter is a piece of equipment designed to measure the energy released or absorbed during a chemical reaction or phase change. Food calorimetry allows us to determine the number of calories per gram of food. One kilocalorie (kcal) is the same as 4.2 kJ (kilojoules) and is the amount of energy needed to raise the temperature of 1 kg (kilogram) of water by 1 degree celsius.

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Ingredient	Proteins (g per 100g)	Fats (g per 100g)	Carbohydrates (g per 100g)	Calories (per 100g)	Weight added (g)

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- 5 Now calculate how many of each nutrient are actually added to your paste (based on the weight you have added of each of the ingredients).

Ingredient	Proteins (g per 100g)	Fats (g per 100g)	Carbohydrates (g per 100g)	Calories (per 100g)	Weight added (g)
Total:					

- 6 Calculate the nutritional content of your food by finishing the table.

- A 13-year-old roughly requires the following in terms of macronutrients per day:
 - protein: 150-170 grams
 - fats: 60-80 grams
 - carbohydrates: 200-220 grams

- 7 What can you say about the amount of nutrients and energy in your paste with that in mind? How much of your food would be needed to fulfil all of the requirements?