

5. SUSTAINABLE SOURCES OF FOOD: HOW CAN WE GROW OYSTER MUSHROOMS?

2-3 HOURS
+ DAILY
OBSERVATIONS

Children learn about the importance of maintaining a healthy and balanced diet and how we should choose the right amount of different types of food from different food groups. They consider the benefits of following a more sustainable diet as an alternative to obtaining meat from animals as a source of protein. The activity culminates in the children being challenged to grow a crop of oyster mushrooms as a sustainable food source before learning about one company's solution to producing protein-rich food in a sustainable way.

TYPE OF ENQUIRY

Observing changes over time

OBJECTIVES

Identify that humans, including animals, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat (Y3 Animals including humans)

Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals (Y6 Living things and their habitats)

Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (UKS2 Working Scientifically)

SCIENCE VOCABULARY

nutrients, carbohydrates, protein, fungi, livestock, climate change

RESOURCES

Commercially available oyster mushroom growing kit (cost at time of publishing is around £5 to £10). To keep costs to a minimum, the whole class might grow oyster mushrooms from one kit. If you wish to try and grow oyster mushrooms without a growing kit, a comprehensive guide and list of equipment can be found at:

<https://grocycle.com/how-to-grow-oyster-mushrooms/>.

Industry sustainability story: **Presentation**

PRIOR KNOWLEDGE / EXPERIENCE

Children will know the importance of eating the right amount of different types of food.

ACTIVITY NOTES

Introduction: Discuss with children how eating the right amounts of different types of food provides a range of nutrients to the body and helps us to maintain a healthy diet. Consider different food and drink choices in terms of what children believe to be healthy and unhealthy for us.

Recap how our food and drink can be categorised into five main groups and that food from each group should be eaten in different amounts over a day, or even a week. The teacher could show an image of a healthy plate or food pyramid to illustrate how most of what we eat should come from the two biggest groups: fruit and vegetables, and carbohydrates such as potatoes, bread, cereal, rice and pasta. Discuss how we should eat moderate amounts of protein such as beans, meat, fish and eggs in addition to food and drink from milk and dairy products. The smallest amount of food should come from food high in fat or sugar.

Focus the discussion on how the global population is increasing, so to ensure that there is enough food for future generations, it is important to consider the 'sustainability' of the diets we eat. This means that the impact the production of the food, such as amount of land and water used and the emission of greenhouse gases, has on the environment is limited.

Explain how, with sustainability in mind, many people believe that a healthy diet today should include lots of plant-based foods, especially if the fruits and vegetables we eat are those that are in season and grown locally. Another example of food that can be grown is the oyster mushroom – which is not a plant but a type of fungi from the group of living things that includes microorganisms such as yeasts and moulds. The oyster mushroom is considered to be an extremely healthy, sustainable, source of food, rich in protein and with high levels of vitamins.

MAIN ACTIVITY: GROW YOUR OWN OYSTER MUSHROOMS

The simplest way for children to grow their own oyster mushrooms in the classroom is for them to use a commercially available oyster mushroom growing kit. These can be obtained relatively cheaply using an internet search or from a local garden centre. The kits should contain everything you will need, including the growing material (a special compost), mushroom spawn and detailed instructions. The mushrooms often take two to four weeks to grow and then the process can be repeated twice more in order to harvest three crops of oyster mushrooms from the same batch.

Children should be encouraged to keep some form of oyster mushroom growth journal or record of measurements and observations over an extended period. They could include scientific diagrams; photographs or time lapse video as well as written explanations. Through their own observations, they should develop an awareness of the three main phases of growth:

- 1. Inoculation:** Oyster mushroom spawn is mixed with a material such as straw, sawdust, wood pellets, cardboard or coffee grounds. This is called a substrate material and it provides the spawn with essential nutrients for it to grow. The mixture is placed into a suitable container with small holes so that air can come in and out.
- 2. Incubation:** The spawn will grow and spread out across the growing material. When the container is placed in a warm (20-24°C) dark room, such as a cupboard or boiler room, the spawn will eat its way across the food. After 10-14 days, they will grow a full web of white, root-like threads.

- 3. Fruiting:** Once the spawn has spread, it is important to expose it to new conditions in order for the mushrooms to grow. This includes: shaded, low level light, fresh air, humidity (spray with water) and cooler temperatures. Small pins will begin to emerge, which grow out of the container into full size mushrooms.

EXTENSION OR HOME-BASED ACTIVITIES

Ask the children if they have any further questions they would like to find answers to as a result of growing oyster mushrooms. They might be interested in finding out what would happen to the growth of mushrooms in different conditions and set up further investigations by changing the original environment in which they have been grown.

QUESTIONS FOR THINKING

- Why do you think it is important to eat different amounts of different types of food each day or week?
- Which plant-based food do you enjoy eating?
- Can you explain whether a mushroom is an animal, plant or something else?
- Why is it important to eat food that has been grown locally?
- What do you think to the idea of 'Meat free Monday'? Why do you think this?

SAFETY GUIDANCE

Some fungi are very poisonous so make sure you obtain the spawn from a reliable source – do not be tempted to gather your own from the countryside. Before and after working with mushrooms, spawn or growing material, ensure that children follow strict hygiene rules by cleaning their hands well with hot soapy water and wiping down all surfaces they are working on with a cleaning spray. Children should not eat during the activity or handle items such as notepads.

We do not advise cooking and eating the mushrooms you have grown. If you decide to, you should follow the guidelines in The ASE booklet *Be safe!* (4th edition), which has a safety code for food hygiene. In addition to this, the 1990 Food Safety Act can be found online.

INDUSTRY LINKS AND AMBASSADORS

Links can be made with the food industry via local companies and company websites. STEM Ambassadors are volunteers from a wide range of science, technology, engineering and mathematics related jobs across the UK. They offer their time and enthusiasm and can be found via the STEM Learning website at <https://www.stem.org.uk/stem-ambassadors>

Ambassadors visiting the classroom could bring real samples of food products and their packaging as well as relevant resources to show the various stages of growing alternative plant or fungi-based sources of food. Children might enjoy having a go at 'taste testing' to see whether they can identify alternative versus original products (once dietary/religious restrictions have been confirmed). To enable children to explore one company's solution to the search for more sustainable sources of food, teachers and children should follow the slides on the presentation **Sustainable sources of food: how can we grow oyster mushrooms?** and engage in discussion points and activities to develop a further understanding of industrial contexts.

CROSS CURRICULAR LINKS

Mathematics: measure, compare, add and subtract lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)

PSHE: to research, discuss and debate topical issues, problems and events that are of concern to them and offer their recommendations to appropriate people; learn that they have different kinds of responsibilities, rights and duties at home, at school, in the community and towards the environment; to continue to develop the skills to exercise these responsibilities