

GREAT GATHER & GROUP

Great
Science
Share
for SCHOOLS

Is there much room for mushrooms in our future society?

AGE RANGE: 11-14 years

OVERVIEW

Pupils will be inspired to undertake an observational enquiry to find out about different types of fungus. They will ask, investigate and share scientific questions related to how mushrooms differ to other types of fungus, and identify and explain how mushrooms are the same and different to other plant species. They practically explore the growth and management of fungus using yeasts and agar plates, considering the implication on fungal growth in a sustainable society.



LEARNING OBJECTIVES

Experimental skills and investigations

- ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
- make predictions using scientific knowledge and understanding
- select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables
- use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety
- make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements

Analysis and evaluation

- present reasoned explanations, including explaining data in relation to predictions and hypotheses



RESOURCES

FOR EACH GROUP (2/3 pupils)

- fresh yeast in 2g blocks
- 3 Agar plates
- pen to label
- inoculating loop
- beaker
- fungal treatment cream, e.g. Clotrimazole for thrush
- stirrer
- 100ml distilled water
- Bunsen burner
- tweezers

TO SUPPORT TEACHING

- Photo Wall
- True/False Quiz
- Videos

Find out more about Carl Linnaeus, famous for his work in taxonomy and the work of the Linnean Society today

The Linnean Society of London is the world's oldest active society devoted to natural history.

www.linnean.org
020 7434 4479
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Who was Linnaeus?

Explore the wealth of content available within The Linnean Society of London's website.



Share your science

www.greatscienceshare.org

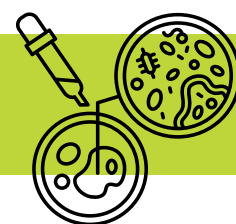


1. **Engage** pupils in looking at the Photo Wall. Ask them to discuss and decide what could be the link between the images. What are the photos showing? What is common to all? What is different? Teachers will recognise that all of the photos are variations of fungus, from athlete's foot to Dead Man's Fingers.
2. **Recall previous learning.** Pupils will have learnt about the features of flowering plants and may have a basic awareness about the difference between plants and fungi. They will have used and developed keys to organise plants into groups. Elicit their prior knowledge through a true/false quiz.
3. Using the [Uses of Mushrooms Video](#), listen to James explaining the uses that mushrooms have in our current world, beyond food stuff. He explains that mushrooms are providing alternative ways to create materials and medicines.



Encourage the pupils to investigate the conditions for growth for mushrooms, if they are to be increasingly used as a sustainable material in the future.

What are the best conditions for growth for mushrooms?
How can fungal growth be sped up or stopped?



- Have 3 Petri dishes prepared for pupils to use as follows:
Dish 1: left with nothing on; Dish 2: with their initial written in fungal treatment cream; Dish 3: the whole dish covered with the treatment cream
- Pupils should label the dishes with date, name and how much treatment cream they have used, if any.
- Place the 2g of fresh yeast into the beaker, add the water and stir. Place the beaker onto the Bunsen burner for roughly 5 minutes or until it is gently simmering to sterilise.
- Once the yeast has cooled down, pour 25ml over the agar plates. The liquid should come just up to the lid line.
- Once all 3 dishes have been filled, place them in the incubator at 40 degrees and leave for 5 days.
- Observe and record results appropriately, using the scientific methods to hypothesise, plan, gather evidence, analyse and interpret data and draw conclusions.



Share your investigation outcomes by relating your conclusions to real-world issues:

- What does your evidence indicate about how fungal growth can be accelerated, e.g. for enabling populations to have healthier lifestyles – e.g. penicillin becoming commercialised for world-wide health needs
- What are the perfect conditions for fungus to grow?
- What does your evidence indicate about how fungal growth can be slowed down, e.g. limiting the spread of fungal infections?

Pupils may consider giving a:

- **presentation in form tutor time**
- **creating a video to share with the Linnean Society**



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Great Gather & Group Photo Wall



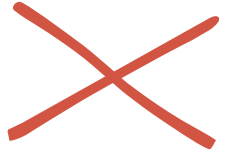
Answers: 1. Yoghurt mold, 2. Ringworm, 3. Tree mushroom, 4. Window sill mold, 5. Dermatitis, 6. Basket fungus, 7. Athlete's Foot, 8. Dead man's fingers, 9. Button mushrooms, 10. Bleeding tooth fungus, 11. Mould on bread, 12. Codycyeps Fungus

Image credits: 1. A Jones, 2. NHS website, 3. Creative Commons Flickr, 4. A Jones, 5. Wikipedia, 6 Creative Commons Flickr, 7. Linnean Society, 8. Linnean Society, 9. Creative Commons Flickr, 10. Linnean Society, 11. Wikimedia, 12. Linnean Society

Great Gather & Group True-False Quiz

1. Fungi can glow in the dark - they are bioluminescent

True - the natural phenomenon of bioluminescence could be used to genetically engineer luminescent trees as a – quite literally – green alternative to streetlights.



2. Most mushrooms are poisonous

False - some fungi may contain mycotoxins which are poisonous to humans, but the medicinal mushrooms are non-toxic and perfectly safe for human consumption.



3. The biggest living organism on the planet is a fungi

True - known as a Honey mushroom.

4. Mushrooms are plants

False - fungi evolved earlier than plants, and plants and fungi have a symbiotic, mutually beneficial relationship. While plants provide nutrients for the fungi, the fungi help produce healthy soil in which the plants can grow.

5. Mushrooms have no nutritional value

False - they may be a beige food, but mushrooms actually have a lot of nutritional benefits.

6. Mushrooms can speak to each other

True - scientists have found that mushrooms 'talk' using electrical impulses that spike when fungi come into contact with food sources or potential dangers.

7. Fungi are dead

False - fungi have several characteristics of living organisms because they have cells with nuclei, require food to stay alive and may even be capable of interacting with their environment.

