

# Medium Term Plan Microbes and drugs



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#### P levels

Performance attainment targets (P scales) and performance descriptors are used for pupils aged 5 to 16 with special educational needs (SEN) who are working below the standard of the national curriculum tests and assessments. PSTT recognises that the national curriculum levels used in this document are no longer current. We have had so many requests to return these materials to the website that they remain in the documents as a guide for those who have used them in the past. The written statements may be useful to others as an indication of children's development. For further information about P levels see: https://www.gov.uk/government/publications/p-scales-attainment-targets-for-pupils-with-sen

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Primary Science Teaching Trust recommends that a full risk assessment is carried out before undertaking in the classroom any of the practical investigations contained in the plans.

#### **Safety Note**

PSTT advises teachers to refer to either CLEAPSS website or SSERC website for up to date health and safety information when planning practical activities for children.





### **Big Questions**

- How are some bacteria friendly?
- How do we get ill?
- What can we do to prevent the spread of disease?
- Are viruses alive?
- Are antibiotics losing their power?
- Can we survive without microbes?

### **Learning Objectives**

#### Pupils will have opportunities:

- To explore the benefits and harmful effects of microbes
- To recognise the importance of being healthy and the helpful and harmful aspects of drugs/ medicines

#### **Answers**

- Some bacteria are helpful in cooking, e.g. making yoghurt and cheese.
- When harmful bacteria reproduce inside our bodies they can produce harmful toxins. Viruses reproduce inside our cells and destroy the host cell when they reproduce. Some fungi grow or colonise under the skin and produce products which cause itching or swelling.
- Hand washing can prevent the spread of infection.
- Viruses are not alive they are packaged DNA and RNA molecules - they need to invade a living organism to replicate.
- Antibiotics are losing their effectiveness because bacteria are becoming resistant to them.
- Humans are dependent on many microbes: bacteria in the digestive system supply us with needed vitamins, bacteria are necessary in decomposition of nitrogen and carbon which are necessary for human life.





### **Quick review activities**

- Look at hazard labels. Check to see if there any on medicines.
- Talk about why we need to keep clean
- List some of the effects of smoking
- Read a story about Jenner
- Watch video and join in chorus <a href="http://www.youtube.com/watch?v=1EkehFkhWf4">http://www.youtube.com/watch?v=1EkehFkhWf4</a>
- Watch <a href="http://www.youtube.com/watch?v=8KLufFAFC9w">http://www.youtube.com/watch?v=8KLufFAFC9w</a> a summary of micro-organisms





### **Vocabulary relevant to this topic**

- Disinfect kill all the germs on a surface
- Alcohol produced when yeast ferments sugars
- Yeast a useful fungus
- Decompose to rot
- Drug a chemical which affects the normal working of the body / brain.
- Microbe tiny living thing. Three main types include bacteria, fungi and viruses.
- Bacteria type of microbe made of one cell, bigger than viruses: include salmonella, E.coli
- Virus type of microbe that has to live in cells, smallest microbe: include flu, HIV, measles
- Fungi type of microbe that includes mushrooms, yeast, ringworm- range in size but usually bigger than viruses and bacteria
- Agar a special jelly to grow bacteria will on
- Colony a 'blob' of bacteria visible to the naked eye
- Nicotine the addictive chemical in tobacco
- Antibiotic kills bacteria (not viruses)
- Yoghurt, cheese, bread, rotten, medicine, tar, prescription (from doctor), mould, ill, sick,





### **Background information about this topic**

- A microorganism or microbe is a small living thing that needs a microscope to see it. There are 4 main types of microbes:
- 1) Bacteria- live everywhere: don't generally photosynthesise: are carried by plants, animals, air and water: multiply by dividing in two: have different shapes e.g. round (coccus), rod shaped (bacillus), spiral (spirillum). They spread diseases, make things rot, break down sewage and help make cheese and yoghurt. Cooking kills many bacteria.
- 2) Fungi live in damp places and on other organisms: reproduce by spores: have no chlorophyll: are made of microscopic threads called hyphae. They cause illnesses like athlete's foot, make antibiotics like penicillin, make bread rise and make beer.
- 3) Protozoa unicellular animals: live in moist places: cause diseases like malaria and sleeping sickness
- 4) Viruses- smaller than bacteria: spread in the same way: multiply inside cells: are not complete cells themselves: cause diseases like colds, flu, AIDS, mumps and chickenpox.
- Microbes help in nature by breaking down dead organisms and releasing nutrients for plants. We use them to make cheese, beer, vinegar, yoghurt, silage, bread, linen and antibiotics. Bacteria are used in the process of genetic engineering. Different types of food preservation work because the conditions living things need to survive are removed e.g. water (drying, salting) warmth (freezing) air (vacuum packing).
- From a chemical perspective there is no difference between drugs and medicines i.e. all drugs are medicines and all medicines are drugs. But in society and the law, a medicine is a chemical substance which cures the disease, is safe to use, has negligible toxicity and does cause not addiction. In contrast, a drug is a chemical substance which also cures the disease but is habit forming, causes addiction and has serious side effects. Drugs are classified as Class A,B,C and carry prison sentences for possession of different times. Many drugs are addictive. Alcohol is a drug that is easy to buy legally over the age of 18 it can affect judgment, mood and reaction times.





#### Objective 1: To explore the benefits and harmful effects of microbes

- Encounters a range of sensory evidence during the activities (P1i)
- May give intermittent reactions to the activities (P1ii)
- Accepts and engages in coactive or shared exploration during the activities (P2i)
- Begins to be proactive in interactions e.g. turning to look at foods (P2ii)
- Explores materials in increasingly complex ways e.g. feeling different foods (P3i)
- Initiates interactions and activities e.g. reaches out to bread dough and help knead (P3ii)

Possible Activities:	Resources:
Experience different foods made by microbes e.g. smell, texture  Experience making elephant toothpaste <a href="http://www.stevespanglerscience.com/lab/experiments/elephants-toothpaste">http://www.stevespanglerscience.com/lab/experiments/elephants-toothpaste</a>	Marmite, bread, beer, yoghurt, cheese, vinegar, plastic bottle, hydrogen peroxide, yeast, washing up liquid, safety glasses, funnel, tray
Optional activities you might like to try include:	Resources:
Experience putting different yeast and sugar into a big bowl and leave for while in warm place.  Experience making bread dough and baking bread.	Different yeasts, sugar, warm water, bowl, flours, access to oven





### Objective 1: To explore the benefits and harmful effects of microbes

Experience making yoghurt
https://practicalaction.org/yummy-yoghurt-makers
Experience making ginger beer
http://www.easy-science-experiments.com/ginger-beer.html

#### **Points to Note:**

Some children think that all microbes are bad - the are not!

Safety awareness:

Sanitise hands and surfaces before tasting.

Be aware of allergies to food.

Avoid ingestion or contact with the skin of sanitising products.





### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

- Allows themselves to be involved in the activity (P1i)
- May have periods of alertness during the activities (P1ii)
- Begins to show an interest in events and objects (P2i)
- Recognises familiar event s e.g. hand washing or objects e.g. pets (P2ii)
- Remembers learned responses over short periods e.g. touching animal with care (P3i)
- Actively explores the objects for more extended periods (P3ii)

Possible Activities:	Resources:
Experience a sensory story about being ill e.g. wrap in blanket to keep warm, use a strip thermometer, having drink, blowing nose, put damp cloth on head	Blankets, strip thermometers, soothing drink, tissues, damp cloth, School pet or 'pretend' pet, pet food and water, clean bedding material,
Experience looking after a school pet e.g. giving it food and water, cleaning out or role play with a 'pretend' pet	





### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

Optional activities you might like to try include:	Resources:
Experience having hands washed with different products. Use 'handwashing ' songs e.g.  http://www.carex.co.uk/hand-hygiene/teaching-hygiene-in-school-hufh/pre-school-learning/hand-washing-songs	Hand sanitizer, hard soaps, liquid soaps, bowls, towels, toy animal, brushes,
Experience stroking a toy animal e.g. on side, same way as fur grows, be gentle, don't drop, use brush to groom animal	
Put some confetti into an un-blown balloon using a funnel. Talk about germs spreading when you sneeze and covering your mouth. Blow up the balloon, as you say "Ah, ah, ah"; when you get to the "Choo" part, let go of the balloon. The confetti represents germs, and that when we don't cover our mouths when we sneeze, our germs are flying everywhere.  Experience a sensory story about looking after a pet / pet needs with appropriate resources to handle	

#### **Points to Note:**

Be aware of any food/ drink allergies

Some pupils may be allergic to pet fur etc.

Pets maybe animals kept outside





#### Objective 1: To explore the benefits and harmful effects of microbes

- Communicates awareness of obvious changes in the yeast, bread or yoghurt (P4i)
- Imitates actions when making bread (P4ii)
- Responds to and follows simple instructions of how to make bread (P5i)
- Identifies where changes have taken place (P5ii)
- Completes a procedure following simple instructions to find out about yeast (P6i)
- Recognises the features of being ill, good and bad personal hygiene (P6ii)

Possible Activities:	Resources:
Put a pack of yeast, warm water and sugar into a large bowl and watch what happens	Bread flour, yeast, salt, sugar, water warm area for the dough to rise, hand sanitizer, sanitizer spray, food technology room for equipment, IWB, Internet access
Explore making bread dough together and then bake a loaf of bread.	access
Watch song about bacteria. <a href="http://www.youtube.com/watch?v=ZrSw0UE7iwl">http://www.youtube.com/watch?v=ZrSw0UE7iwl</a> .	
Ask pupils who has been ill lately, how did they feel and how did they get better.  Begin to talk about what germs can do to us. <a href="http://www.youtube.com/watch?v=DYKADcR34Y8">http://www.youtube.com/watch?v=DYKADcR34Y8</a>	





### Objective 1: To explore the benefits and harmful effects of microbes

Optional activities you might like to try include:	Resources:
Explore making yoghurt together.	Full fat milk, natural live yoghurt to get the culture from, container, vinegar, marmite, bread, yoghurt, ginger beer, blue cheese
Explore examples of foods which require microbes to make them. E.g. marmite, bread, beer, yoghurt, cheese and vinegar. Pupils can smell or taste the foods	
Role play/ imitate good and bad personal hygiene e.g. sneezing and coughing over people, using tissue to wipe nose and disposing of correctly, washing hands and hair etc	
Demonstrate making elephant toothpaste <a href="http://www.stevespanglerscience.com/lab/experiments/elephants-toothpaste">http://www.stevespanglerscience.com/lab/experiments/elephants-toothpaste</a>	
Look at some household products that we use to kill germs e.g. and look at the hazard labels	

#### **Points to Note:**

Pupils might think that all microbes make us ill.

#### Safety awareness:

Ensure surfaces and hands are sanitized before commencing making bread. Make in hygienic conditions.

Burning hazard when using ovens.

Be aware of skin and food allergies





#### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

- Explores objects provided using any sensory mode (P4i)
- Uses the pet or medicine resources, following step by step instructions, to gain information (P4ii)
- Responds to simple scientific questions e.g. can you show me a medicine? (P5i)
- Takes part in activities focused on anticipation of something e.g. taking turns washing hands or feeding pets (P5ii)
- Responds to simple scientific questions that require a more detailed response than P5 e.g. can you find things a dog needs to keep it healthy? (P6i)
- Recognises the distinctive features of objects and where they belong e.g. things for different pets or how to tell a medicine from harmless containers (P6ii)

Possible Activities:	Resources:
Help look after a school pet e.g. giving it food and water, cleaning out or role play with a 'pretend' pet  Practise washing hands with different products e.g. solid soap, liquid soap. <a href="http://www.youtube.com/watch?v=07YNCFIS0il">http://www.youtube.com/watch?v=07YNCFIS0il</a> If appropriate put food colouring or handcream with glitter on hands to represent germs and see how long it takes to remove it using different soaps.  Show pupils some different medicines bottles and other bottles and talk about how they can distinguish them. Are there any safety labels to warn them like they have on household products? What do medicine bottles have? E.g. child proof caps	Liquid and hard soaps various, food colouring, hand cream, glitter to put in hand cream, access to sinks and water, towels Range of medicine bottles and other bottles to compare, School pet or 'pretend' pet, pet food and water, clean bedding material,





### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

Optional activities you might like to try include:	Resources:
Use a variety of toy animals. Pupils pass toy animal round and show how to stroke it and then pick something from a selection that animal needs to keep it healthy.  Tell pupils you were cleaning out the medicine cupboard in school when a bag of sweets fell out and got mixed up. Can they sort sweets from 'tablets'? Have some medicine tablets to show them that they look like sweets e.g. throat pastilles, vitamin tablets etc. Talk about why it is dangerous.  Give pupils some images of children to sort into ones where children are sick and ones where they look healthy .	Mixture of sweets that look like tablets e.g. fruit pastilles, fizzers, images of healthy and sick children to sort, toy animals or animal images, actual examples of pet food, bedding, water bowls and bottles, grooming articles etc
If appropriate younger pupils could create a pet shop or experience a sensory story about looking after a pet with appropriate resources to handle.  Listen to <a href="http://www.youtube.com/watch?v=6qh_qTOgkhY">http://www.youtube.com/watch?v=6qh_qTOgkhY</a> and make animals noises as animals appear.  Compare some white powders and talk about how pupils know which are safe. Show them powders in original packaging and then transfer some to plastic bags and why the powders are now dangerous.	





#### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

#### **Points to Note:**

Pupils might think that all medicines are good for you and that you only go to the doctors when you are ill.

Be aware of those pupils who have medical conditions and regular hospital visits.

Caution with medicines -can show empty boxes and containers if necessary.

Watch pupils don't rub eyes of using hand cream with glitter to mimic germs





#### Objective 1: To explore the benefits and harmful effects of microbes

- Shows an awareness of treating things the same e.g. suggests wrapping the same food in different things (P7i)
- Communicates related ideas and observation about how germs can spread and get into the body (P7ii)
- Contributes to planning an investigation (P8i)
- Locates the right equipment to use for simple investigations (P8ii)

Possible Activities:	Resources:
Explore what makes food go mouldy e.g. light, warmth, water  Pupils use the game at: <a href="http://www.sciencekids.co.nz/gamesactivities/microorganisms.html">http://www.sciencekids.co.nz/gamesactivities/microorganisms.html</a> to find all of the ways which microbes help us.  Teacher tells the pupils that germs can only make us ill if they get inside our body. Pupils draw on a body template to show all of the places where they think microbes could enter.  Make yoghurt and try different types of milk. Prepare in hygienic conditions if you	Internet access, speakers, IWB, Sandwich bags / petri dishes, food to test e.g. bread, access to fridge, water. Body template, different types of milk, live yoghurt, containers, warm water





### **Objective 1: To explore the benefits and harmful effects of microbes**

Optional activities you might like to try include:	Resources:
Explore wrapping foods in different things to see which keeps food from going off the best	Cling film, foil, greaseproof paper, kitchen roll, plastic bags.IWB, Internet access, speakers, dry yeasts, fresh yeast, brown and white sugar, strong flour – brown and white, plain flour, SR flour
Pupils watch the swine flu advert to show how germs can be spread from one person to another: <a href="http://www.youtube.com/watch?v=SqVOxf7UMaE">http://www.youtube.com/watch?v=SqVOxf7UMaE</a> Make a class poster to help stop germs spreading  Investigate how yeast works and try different yeasts and sugar. Then extend to making bread and try different flours.	
Explore which foods go mouldy the fastest  Watch Elmo and Rosita explaining how to stop germs from spreading when sneezing: <a href="http://www.youtube.com/watch?v=QW1yodZJpG8">http://www.youtube.com/watch?v=QW1yodZJpG8</a> Pupils try to think of as many other ways as they can to stop the spread of germs. Props could be used to help them to guess	





### Objective 1: To explore the benefits and harmful effects of microbes

#### **Points to Note:**

Pupils may not realise that microbes are involved in rotting. They may also think all microbes are bad and they are spread by dirty hands.

Safety awareness:

Do not open bags / petri dishes once the experiment has been set up.

Follow safe disposal procedures.

Some pupils may be allergic to milk and gluten





#### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

- Looks through simple sources to locate information about pets, smoking or medicines (P7i)
- Identifies some obvious hazards linked to medicines and smoking (P7ii)
- Sorts medicines and foods into two groups or objects for different pets (P8i)
- Identifies obvious risks and how they can be reduced e.g. using Hazard labels or child proof lids (P8ii)

Possible Activities:	Resources:
Talk about things humans and animals need to help us live. Match animals to different foods and talk about why they need special food. Use clips such as http://www.bbc.co.uk/learningzone/clips/looking-after-pets-dogs/59.html	Images of animals to match to foods.  empty cigarette packaging,
http://www.bbc.co.uk/learningzone/clips/looking-arter-pets-uogs/39.html	
Show a clip about what things are classed as drugs: <a href="https://www.bbc.com/bitesize/articles/zg982nb">https://www.bbc.com/bitesize/articles/zg982nb</a>	flashcards showing the new key words: smoke, nicotine, addictive, tar, cancer, heart attack, lungs
Look at empty cigarette packaging for the pictures of diseases caused by smoking.  Teacher introduces the words: smoke, nicotine, addictive, tar, cancer, heart attack, lungs) and class makes poster/ collage with images and words/ symbols	





### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

Optional activities you might like to try include:	Resources:
Show pupils a range of animal pictures and ask which they would like for a pet and why? What makes a good pet? What do animals need to keep them healthy? What do humans have to provide?  Watch video about going to the doctors and talk about why we might need to go to the doctor. What helps us decide?  e.g. <a href="http://www.youtube.com/watch?v=HSNzhVMteDA">http://www.youtube.com/watch?v=HSNzhVMteDA</a>	Animal /pet images, symbols and images of things pets need.  Range of medicines ( use empty packs and bottles) that cover liquid, tablets, capsules, powder and range of foods in bottles and packs.
Show pupils a range of different medicines and foods and ask them if they can sort them into two groups- medicine and not medicine. Talk about how we know which packs are food and which are medicines.	
Show range of equipment that we need to look after different pets. Ask them to group the equipment with the correct pet picture	
Talk about how we try to make medicines safe- prescription only, child safety caps, dosage instructions, hazard symbols, taste is deliberately horrible.	
Sing along to <a href="http://www.youtube.com/watch?v=kdVRWT7dc9k">http://www.youtube.com/watch?v=kdVRWT7dc9k</a> and talk about what you should do when not feeling well.	





### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

#### **Points to Note:**

Pupils may think that:
smoking cleans out the lungs,
that people can stop easily,
that smoking is not dangerous / unhealthy because they know an old person who smokes.

Awareness that some students may have lost family members to smoking related diseases or have family members who smoke.





#### Objective 1: To explore the benefits and harmful effects of microbes

- Shows an understanding of comparative language e.g. more less (L1i)
- Responds to prompts by making suggestions on how to find the answer or make observation when investigating microbes (L1ii)
- Identifies changes when observing microbial actions (L1iii)
- Makes suggestions about how to find things out or how to collect data to answer a question they are investigating (L2i)
- Ranks their samples in order of 'rottenness' / mouldiness (L2ii)
- Spots when a simple test is unfair (L2iii)
- Says what they are going to keep the same or change to make a fair test (L3i)
- Selects equipment from that provided to address a question under investigation (L3ii)
- Identifies straightforward patterns in presented observations (L3iii)





### Objective 1: To explore the benefits and harmful effects of microbes

Possible Activities:	Resources:
Optional activities you might like to try include:	Resources:

**Points to Note:** 





#### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

- Uses everyday terms to communicate their ideas communicate their ideas (L1i)
- Recognises some of the dangers of smoking, alcohol or drugs (L1ii)
- Shares own ideas and listens to the ideas of others when talking about smoking, alcohol or drugs (L1iii)
- Draws on observation and ideas to offer answers to questions about alcohol, smoking or drugs (L2i)
- Presents evidence or information in an ordered way (L2ii)
- Uses simple scientific vocabulary when talking about problems associated with alcohol, smoking or drugs (L2iii)
- Expresses their views about the effects of drinking alcohol, smoking or drugs using scientific terminology (L3i)
- Selects information from that provided to link smoking or alcohol to negative impacts on health (L3ii)
- Presents simple data in more than one way e.g. leaflet, mobile, video (L3iii)





### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

Possible Activities:	Resources:
Pupils think, pair, share the consequences of drinking and the teacher forms a list on the board.  Pupils are given a selection of images showing things that can happen after too much alcohol e.g. pictures of beer bellies, people vomiting, people unconscious, a person with a head injury, a car crash, liver with cirrhosis. They try to add key words or symbols to the pictures e.g. overweight, unconscious, vomit, injury, drunk, health.  Produce a leaflet or video about the harmful effects of drinking, smoking, taking drugs	IWB and speakers. Access to the internet and computers. A4 print out with pictures of beer bellies, people vomiting, people unconscious, a person with a head injury, etc.  Matching key words such as cirrhosis, cancer, obesity, unconscious, vomit, injury, drunk,  paper, images, computer access, secondary resources about smoking





### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

Optional activities you might like to try include:	Resources:
Watch <a href="http://www.youtube.com/watch?v=-mjTchyMcD4">http://www.youtube.com/watch?v=-mjTchyMcD4</a> about effect of smoking on body .  Listen to <a href="http://www.youtube.com/watch?v=plkvW6gq0GU">http://www.youtube.com/watch?v=plkvW6gq0GU</a> and introduce the words: smoke, nicotine, addictive, tar, cancer, heart attack, lungs) and use empty cigarette packaging , other images and vocabulary to create mobiles about problems with smoking.	IWB, speakers, internet access,  Fashcards showing the new key words: smoke, nicotine, addictive, tar, cancer, heart attack, lungs, soft ball, mini-white boards to write on after spinning round, nuts and bolts, mittens





#### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

Show a clip about what things are classed as drugs <a href="http://www.youtube.com/watch?v=CH3uAGPqt-k">http://www.youtube.com/watch?v=CH3uAGPqt-k</a> and

http://www.youtube.com/watch?v=PwOIRELZNv8

#### Select images from

https://www.google.co.uk/search?

q=dangers+of+drugs+and+alcohol+for+kids&sa=N&rlz=1C1BLWB\_enGB522GB531 &espv=210&es\_sm=93&tbm=isch&tbo=u&source=univ&ei=iyx6UoX5Doal7AaJo4G QCg&ved=0CFsQsAQ4Cg&biw=1280&bih=629 and talk about what they are showing. Or use one to undertake a Reading Images activity. Place image in middle of large sheet of paper and draw two boxes around the image- each one getting progressively larger. In the first border round the image write down everything pupils can see in the image. In the next border write down either any questions they have or anything they can infer or deduce from the image

Try some of the games at

http://www.ehow.co.uk/info\_7954738\_games-teach-children-drugs-alcohol.html to mimic the effects of drugs on the body

Other clips to use include

http://www.brainpop.co.uk/psheandcitizenship/pshedrugeducation/drugabuse/preview.weml

http://kidshealth.org/teen/drug\_alcohol/drugs/know\_about\_drugs.html





### Objective 2: To recognise about being health and the helpful and harmful aspects of drugs/ medicines

#### **Points to Note:**

Pupils may not think that alcohol is dangerous or be aware that the dangers of alcohol are only long term.

Pupils may think:

that smoking cleans out the lungs,

that people can stop easily and that smoking is not dangerous / unhealthy because they know an old person who smokes that low tar cigarettes are not harmful

#### Safety awareness:

Awareness that some student may have lost family members with alcohol or smoking related diseases.