

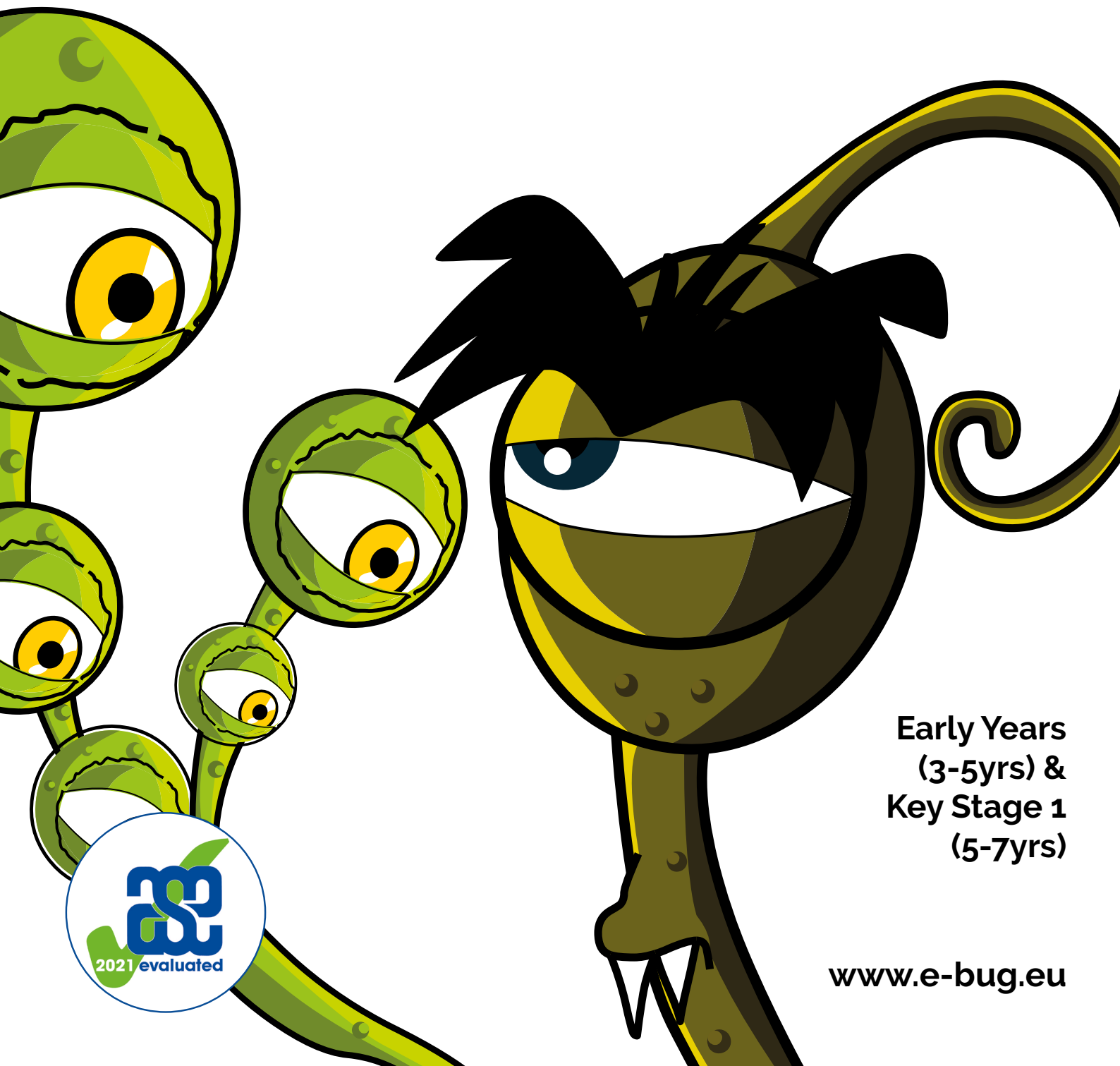
# e-Bug: An international educational resource covering the world of microbes and disease.



**e-Bug**

operated by UK Health  
Security Agency

Lesson plans, worksheets and activities



**Early Years  
(3-5yrs) &  
Key Stage 1  
(5-7yrs)**



[www.e-bug.eu](http://www.e-bug.eu)



# Welcome to e-Bug

e-Bug has been designed to bring the world of microbes and antibiotics to life for children in the school environment. It is a curriculum supplement series (Early Years, Key Stage 1, 2, 3 and 4) that complies with the Department for Education educational standards for junior and senior schools.

This resource has been created by the UK Health Security Agency (formerly Public Health England) in collaboration with 17 EU partner countries to foster an interest in science and to improve young people's knowledge and understanding about microbes, infection prevention and control, and prudent antibiotic use, thereby

empowering them to be proactive in looking after their own health. Lesson plans can be used in sequence or as individual activities designed to fit into 50-minute classroom slots. These tools can be used freely by educators and may be copied for classroom use but may not be sold.

Over 27 international countries are involved in the e-Bug project, and the resources have been evaluated with more than 3000 children in England, France and the Czech Republic. The e-Bug pack is supported by a website from which all the pack resources, videos, images and additional activities can be downloaded ([www.e-bug.eu](http://www.e-bug.eu)).

**Each section of the pack contains detailed lesson plans, student worksheets and handouts some of which are available in MS PowerPoint format for whiteboard use:**

- **Creative inquiry based activities to promote active learning**
- **Highlighted learning outcomes which**

**deepen students' understanding of the importance of microbes, their spread, treatment and prevention**

- **Activities that encourage students to take more responsibility for their own health**
- **Activities that highlight the importance of responsible antibiotic use**

We would like to thank everyone involved in the development of this resource which will help the next generation of adults to use antibiotics more wisely.

We would especially like to thank the teachers and students across the UK, and Europe who participated in focus groups and the evaluation process and helped ensure that these materials are not only fun and exciting but also effective.

We do hope you enjoy using e-Bug and will find this an invaluable addition to your classroom.

If you would like to keep up to date with our latest resources, or the research and development that we undertake please register for our quarterly newsletter at: [www.e-bug.eu/uk-newsletter](http://www.e-bug.eu/uk-newsletter)

As educators, your feedback is invaluable to us. Your comments will help the e-Bug resource grow and evolve. Please send any comments, queries and suggestions to:

Primary Care and Interventions Unit  
UK Health Security Agency  
Twyver House, Bruton Way  
Gloucestershire  
GL1 1DQ

Or alternatively visit the e-Bug website and contact us at [www.e-bug.eu/uk-contact-us](http://www.e-bug.eu/uk-contact-us)

*The e-Bug Team*

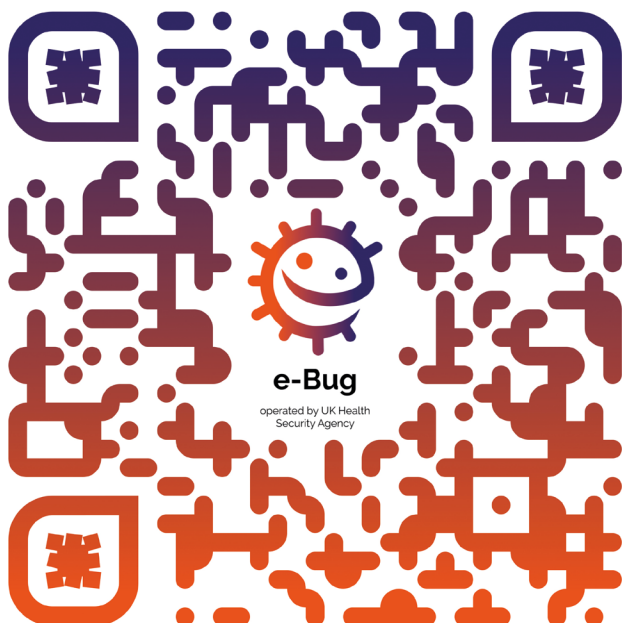
## Take our teacher survey!

To celebrate the launch of the new e-Bug packs in England, every teacher that completes our new survey will be entered into a prize draw to win a set of giant microbes ([www.giantmicrobes.com](http://www.giantmicrobes.com)) for your school.\* Your feedback will help us improve e-Bug.

**Winners will be announced at the end of January 2022**

**To enter please scan the QR code below:**

*\*One entry per person*



[www.e-bug.eu/ukpacksurvey](http://www.e-bug.eu/ukpacksurvey)

# An international educational resource covering the world of microbes and disease

e-Bug resources are available in the following languages

Basque Country - Basque, Spanish	Latvia - Latvian
Belgium - French	Lithuania - Lithuanian
Bulgaria - Bulgarian	Norway - Norwegian
Cyprus - Cypriot	Poland* - Polish
Czech Republic* - Czech	Portugal* - Portuguese
Denmark* - Danish	Romania - Romanian
England* - English	Saudi Arabia - Arabic
France* - French	Scotland - English, Gaelic
Germany* - German	Spain* - Spanish
Greece* - Greek	The Netherlands - Dutch
Hungary - Hungarian	Turkey - Turkish
Ireland - English, Gaelic	Ukraine - Ukrainian
Italy* - Italian	Wales* - English, Welsh
Kosovo - Albanian	

\*Original partner countries

Visit [www.e-bug.eu](http://www.e-bug.eu) to view our partner profiles and translated versions of the resources.

e-Bug is operated by UK Health Security Agency



# The e-Bug Learning Journey

**Key Stage 2**

Ages: 7 to 11 years

**Early Years**

Ages: 3 to 5 years

**The e-Bug learning journey begins..**  
Children are introduced to microbes and positive behaviours for hand washing, respiratory and oral hygiene.

**Oral health**

Students learn about dental plaque and the impact of sugar on their teeth.

**Marvellous Microbes**

Students develop their hand and respiratory knowledge and explore different types of harmful and useful microbes.

Spread of Infection

**Key Stage 1**

Ages: 5 to 7 years

**Micro-organisms**



e-Bug

### Discovery

Students are introduced to vaccines, antibiotics and the transmission of microbes from and to food and animals.

### Empowered

Students increase their knowledge of antimicrobial resistance, understand how to communicate important scientific messages within the community and strengthen their self-care techniques.

### Infection control

Students apply their problem-solving skills to outbreaks and are introduced to herd immunity and infectious diseases.

### Sexual Health

Students learn how easily infection can spread through sexual contact and how to protect themselves.

Prevention of Infection

**Key Stage 3**

Ages: 11 to 14 years

**Key Stage 4**

Ages: 14 to 16 years

Treatment of Infection

# Contents

## Early Years

### **Spread of Infection**

#### **Lesson 1 – Hand Hygiene**

By taking part in a classroom experiment children learn why it is important to wash hands properly, and learn the best method and order for hand washing.

**Page 14**

### **Spread of Infection**

#### **Lesson 2 – Respiratory Hygiene**

Children learn how easily harmful germs (microbes) spread through sneezing.

**Page 22**

### **Prevention of Infection**

#### **Lesson 3 – Oral Hygiene**

Children learn how to brush their teeth and understand that we brush our teeth at least twice per day to avoid tooth decay.

**Page 28**

**e-Bug has been designed to bring the world of microbes and antibiotics to life for children in the school environment**



## **Key Stage 1**

### **Micro-organisms**

#### **Lesson 1 – Introduction to Microbes**

This lesson is designed to introduce students to viruses, bacteria and fungi. The introductory activity allows students to combine their observational and creative skills to make a microbe of their own choice, exploring various microbial types and shapes.

**Page 36**

### **Spread of Infection**

#### **Lesson 2 – Hand Hygiene**

By taking part in a classroom experiment students will understand how soap and/or sanitisers work and that hand washing is the best way to remove microbes.

**Page 50**

### **Spread of Infection**

#### **Lesson 3 – Respiratory Hygiene**

In this fun experiment students learn how easily microbes can be spread through coughs and sneezes and recreate a sneeze.

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### **Prevention of Infection**

#### **Lesson 4 – Oral Hygiene**

Students learn how plaque forms and why and how sugary food and drink can damage your teeth.

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# Early Years Framework Links

## Spread of Infection

### Lesson 1 – Hand Hygiene

*Communication and  
language development:*

Listening and attention  
Understanding  
Speaking

*Physical development:*

Health and self-care

*Expressive arts  
and design:*

Exploring and using  
media and materials

## Spread of Infection

### Lesson 2 – Respiratory Hygiene

*Communication and  
language development:*

Listening and attention  
Understanding  
Speaking

*Physical development:*

Health and self-care

*Expressive arts  
and design:*

Exploring and using  
media and materials

## Prevention of Infection

### Lesson 3 – Oral Hygiene

*Communication and  
language development:*

Listening and attention  
Understanding  
Speaking

*Physical development:*

Health and self-care

*Expressive arts  
and design:*

Exploring and using  
media and materials

**e-Bug is a curriculum  
supplement series  
(Early Years, Key  
Stage 1, 2, 3 and 4)  
that complies with  
the Department for  
Education educational  
standards for junior  
and senior schools**

# Key Stage 1 National Curriculum Links

## Micro-organisms

### Lesson 1 – Introduction to Microbes

**Science:**

Working scientifically,  
Living things and their  
habitats

**PSHE/RSHE:**

Health and prevention

**English:**

Reading and  
comprehension, Writing

## Spread of Infection

### Lesson 2 – Hand Hygiene

**Science:**

Working scientifically,  
Living things and their  
habitats

**PSHE/RSHE:**

Health and prevention

**English:**

Reading and  
comprehension, Writing

## Spread of Infection

### Lesson 3 – Respiratory Hygiene

**Science:**

Working scientifically,  
Living things and their  
habitats

**PSHE/RSHE:**

Health and prevention

**English:**

Reading and  
comprehension,  
Spoken Language

**Mathematics:**

Comparing  
measurements

## Prevention of Infection

### Lesson 4 – Oral Hygiene

**Science:**

Working Scientifically,  
Living things and their habitats

**PSHE/RSHE:**

Health and Prevention

**English:**

Reading and comprehension,  
Writing



# Teacher Refresher Information

Optional background information for each of the pack topics has been included to help you plan your lessons and introduce the topic to students. Look for the Early Years or Key Stage 1 logo below.

## Micro-organisms:

### Introduction to Microbes



KS1 Lesson 1

Micro-organisms, more commonly known as germs, bugs or microbes, are tiny living things too small to be seen with the naked eye. They are found almost everywhere on Earth. Some microbes are useful, and others can be harmful to humans. It is important to clarify that microbes are not innately useful or harmful. Rather that some microbes can be useful to humans whilst others can be harmful depending on the situation. For example, the mould *Aspergillus* is used to help make chocolate, however can cause harm to humans if inhaled into the lungs. Although extremely small, microbes come in many different shapes and sizes. The three groups of microbes covered in the resource are viruses, bacteria and fungi.

**Viruses** often cause illnesses like coughs and colds. Viruses need to live inside a living organism, such as plants and animals, to make more viruses.

**Bacteria** are single-celled organisms that can grow very quickly and can in some circumstances make substances (toxins) that are harmful to humans. Other bacteria are completely harmless to humans, and some are useful and help us make food like yoghurt and can be good for our health. Bacteria can be divided into three groups based on their shapes – cocci (balls), bacilli (rods) and spirals. Scientists and healthcare workers can use these shapes to identify which infection a patient has.

**Fungi** are the largest of the three microbes described, they get their food by either

decomposing (breaking down) dead plants and animals, or by growing on another living thing. Fungi can be harmful by causing infection or being poisonous to eat; others can be useful or harmless, some fungi like *Penicillium* help us make medicines.

### Spread of Infection:

There are many ways our bodies can be exposed to infection and several things that we can do to help prevent this happening. In this teacher refresher section we only cover information for the activities contained in this resource.

### Hand Hygiene



EY Lesson 1



KS1 Lesson 2

Schools are a haven for potentially harmful microbes that can spread rapidly from child-to-child via touch. Our skin naturally secretes oil which helps to keep our skin moist and stops it getting too dry. This oil, however, is a perfect place for microbes to grow and multiply and helps microbes 'stick' to our skin. Although our hands are naturally covered in useful bacteria (also known as flora), our hands can easily pick up harmful microbes from our surroundings (e.g. home, school, garden, animals, pets, food), surfaces and even through the air. These harmful microbes can spread quickly and easily from child-to-child via touch and can make us poorly if swallowed. Washing your hands is one of the best ways to stop harmful microbes from spreading and prevent us from becoming sick.

Washing hands in water alone, even cold water, will eliminate visible dirt and grime.

However, soap is required to break up the oil on the surface of the hands which trap microbes.

Hand sanitisers can be used where soap and water is not available. When possible, liquid soap should be used instead of bars of soap, especially if used by multiple people.

Hands should be washed:

- Before, during and after preparing food
- After using the bathroom
- After exposure to animals or animal waste
- After coughing, sneezing or blowing your nose
- If you're ill or have been around ill people
- After outdoor play

Hand sanitisers with ingredients like alcohol work by destroying microbes as they dry, but don't kill all types of harmful microbes and don't remove visible dirt or other substances from our skin. Therefore, hand sanitisers should not be generally used after using the toilet.

## Respiratory Hygiene



EY Lesson 2



KS1 Lesson 3

Respiratory infections are infections that happen in the lungs, chest, sinuses, nose and throat, for example, coughs and colds, the flu and pneumonia. These infections can spread from person-to-person through the air, through person-to-person contact (touching hands, hugging, kissing) or by touching contaminated surfaces. The microbes can be spread by getting into the non-infected person's nose or eyes because they touch their face with contaminated hands.

The most common mode of spreading infection is through coughs and sneezes. Sneezing is a way in which our body tries to get rid of any harmful microbes and dust particles we might inhale. The harmful microbes and dust get caught on the nose hair and tickle our nose or might irritate the back of our throat or our lungs. The nose sends a message to the brain which then

sends a message back to your nose, mouth, lungs and chest telling them to blow the irritation away. In the case of colds and flu, millions of virus particles rush out and contaminate the surface on which they land; this could be our food or hands.

Colds and flu are the most common illnesses in childhood settings and perhaps among the most contagious. COVID-19 is the name of the disease caused by the virus SARS-CoV-2. and can be very contagious. As colds, flu and COVID-19 are caused by viruses, they cannot be cured by antibiotics. When we catch a cold or flu rest and drinking plenty of fluids are generally recommended however, if symptoms persist then a visit to the local doctor or pharmacist is required. Symptoms of colds and flu include headache, sore throat and fever. Colds can also cause runny noses. Many sore throats associated with colds and flu are due to the viruses in the throat making it inflamed and feeling raw. Breathing in through the mouth causes the throat to feel dry and continual coughing can aggravate sore throats and contribute to an aching feeling.

Teaching good respiratory hygiene from a young age, such as covering your coughs and sneezes or regularly washing your hands for 20 seconds, can help prevent the spread of these infections. This is especially important in the approach to the winter cold/flu season each year. It is a natural reflex to put our hands towards our faces when we sneeze, but it is important to replace this action with new habits of respiratory hygiene to reduce the spread of infection:

Cover your sneezes, dispose of tissues and regularly wash your hands.

- **Catch it:** cover your mouth and nose with a tissue. If you don't have a tissue, cover with your upper sleeve or elbow (not your hands).

- **Bin it:** throw away the used tissue at once to avoid spreading infection to surfaces, or other people.
- **Kill it:** wash your hands well with soap and water, or hand sanitiser if soap and water are not available, immediately after throwing the tissue in the bin.

We can help prevent the spread of these infections (like the flu and COVID-19) by getting vaccinations. Check government links on why a different flu vaccine is needed each year.

Learning about respiratory hygiene provides a chance to talk to students about vaccinations, a vaccination they may be familiar with is the annual flu vaccine.

## Prevention of Infection:

### Oral Hygiene



EY Lesson 2



KS1 Lesson 3

Normally our first teeth come through our gums (erupt) at around 6 months of age and we will have a full set of 20 baby (primary) teeth by the time we are 2 ½ years old.

At around 6 years old our first permanent molars erupt and the front primary teeth begin to get wobbly and fall out (exfoliate) and are replaced by the permanent (adult) teeth. On average by 12 years old we have lost all of the baby teeth and have 32 adult teeth, which if we look after, can last for the rest of our lives.

Bacteria can grow on teeth, clumping together to form a sticky substance called dental plaque. You will see this in your own mouth as a creamy line around your teeth or sometimes feel it as a furry layer with your tongue. If plaque is not brushed away regularly or there is a high frequency of sugar in the diet, the bacteria within the plaque can lead to tooth decay (caries).

When we eat sugary foods and drinks, bacteria in the plaque can use the sugars to make acid. Over time this can dissolve the outer surface of our teeth (the enamel). As more enamel is dissolved, a hole (cavity) appears. As the decay process continues, the bacteria can reach the nerve and cause toothache.

If no dental treatment is given, the tooth decay (caries) can spread and bacteria can penetrate the nerve, leading to inflammation of the bone and surrounding structures of the teeth which can result in an abscess (lump on the gum) that is filled with pus. This can make you very poorly and the tooth will usually need to be removed (extracted).

Dental health is extremely important; over 23% of children in England have tooth decay and it is the main reason for children aged 5 to 9 being admitted to hospital. The good news is that tooth decay can be prevented by limiting the number of times we eat foods and drinks with added sugar, brushing twice a day with fluoride toothpaste and regularly seeing the dentist to check the health of our teeth and gums.

Fluoride in toothpaste can help strengthen our teeth and slow down the decay process. The most important time to brush teeth with fluoride toothpaste is before going to bed at night. To make it easy to remember it is best to add tooth brushing to a twice daily hygiene routine morning and night.

### Healthy Eating

In the UK, 34% of primary school children are now overweight and children are now eating three times more sugar than they should. Half of the sugar children eat comes from unhealthy snacks and sugary drinks. Fruit and vegetables are still the healthiest snack choice.

# **Early Years Lesson Plans**

**All lesson plans  
and supporting  
materials  
contained in this  
pack are available  
to download  
as modifiable  
templates from  
the e-Bug website**





# Spread of Infection: Hand Hygiene

By taking part in a classroom experiment children learn why it is important to wash hands properly and learn the best method and order for hand washing.

## Early Years Framework links

### Communication and language development

- Listening and attention
- Understanding
- Speaking

### Physical development

- Health and self-care

### Expressive arts and design

- Exploring and using media  
and materials

## Key Words

Soap, Hygiene, Infection

## @ Weblink

[e-bug.eu/eng/EYS/lesson/  
Hand-Hygiene](http://e-bug.eu/eng/EYS/lesson/Hand-Hygiene)

## Learning Outcomes

Children will:

- Understand that we wash hands to remove germs (microbes).
- Understand the sequencing of hand washing and nose blowing.
- Understand how to blow their nose to minimise the risk of transmission of infection.





## Resources Required

**Main Activity: Balloon Hands**  
*Per child*

Disposable plastic/vinyl gloves

*Per group or class*

Basin

Water

Hand soap

Washable black marker

**Extension Activity: Hand Washing and Nose Blowing Flashcards**

TS1 Hand Washing and Nose Blowing Flashcards

**Extension Activity: Picture Sequencing Activity**  
*Per child*

SW1 Picture Sequencing Activity

Glue sticks & paper or card

**Extension Activity: Hand Washing Chart**  
*Per child*

SW2 e-Bug Healthy Hands Hand Washing Progress Chart

## Advance preparation

1. Fill a basin with soapy water
2. Inflate vinyl gloves with air and tie at the bottom to create hand balloons
3. Draw circles and dots on the balloon hands with washable marker to resemble germs

## Health and Safety

Ensure that children have no soap allergies or sensitive skin conditions

For safe microbiological practices in the classroom consult CLEAPPS [www.cleapps.org.uk](http://www.cleapps.org.uk)

## Supporting Materials



TS1 Hand Washing and Nose Blowing Flashcards



SW1 Picture Sequencing Activity – Place hand washing in the correct order

		MON	TUE	WED	THU	FRI
Healthy Hands Handwashing Chart	I washed my hands before school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Name <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I washed my hands after breaktime	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Class <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	I washed my hands before lunch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Add a picture or star each time you wash your hands!						

SW2 e-Bug Healthy Hands Hand Washing Progress Chart

# Lesson Plan



## Introduction

When introducing students to the concept of microbes, you can refer to the teacher refresher section for more information.

1. Begin the lesson by asking how many children have washed their hands today? Ask them why they washed their hands (to wash away any dirt or germs microbes that might be on their hands) and what would happen if they didn't wash their hands (they might get ill as they ingest harmful microbes on their hands).
2. Talk to the children about how we use our hands all the time, and that they pick up millions of microbes every day. Although many of these are harmless, some could be harmful. Explain that we spread our microbes to our friends and others through touch, and this is why we wash our hands.
3. Describe key times we should be washing our hands (especially after using the toilet and before eating).
4. Explain to the children that they are going to do an activity to demonstrate how microbes are all over our hands and how best to wash them off.

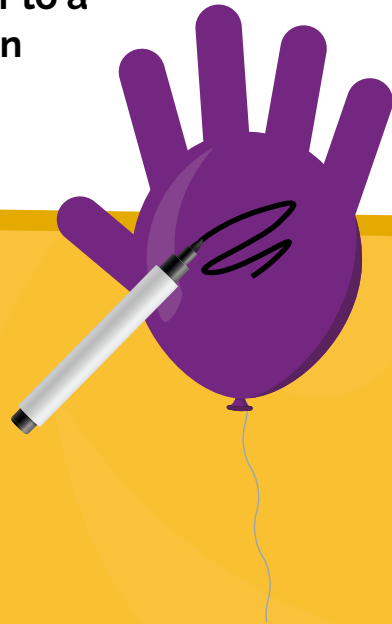
## Discussion

Discuss with the children where the microbes on the balloon hands may have come from. Emphasise to children that not all the microbes on their hands are harmful; there may also be useful microbes there too.

Emphasise to the children that we also need to wash our hands properly. Highlight that microbes like to hide in between fingers and under the nails. It is important to know both **WHEN** and **HOW** to wash our hands properly to prevent spreading microbes and potentially infection. When you must sneeze and you can't wash your hands, a solution may be to sneeze or cough onto your sleeve/elbow.

## Main Activity: Balloon Hands

**1 Add marks using washable marker to a balloon**



**2 Wash the marks off the balloon**



**3 What did you see?**

1. Demonstrate how to wash the marker off the balloon hands with soapy water.
2. Provide each child with a balloon hand covered in microbes (washable marker).
3. The children should take turns thoroughly scrubbing the marker off the balloon hands in the basin of soapy water.
4. Have a conversation with the children about what they saw. How long did it take for all the microbes to disappear? Why do you think it's important to wash our hands? If we didn't use soap would it have worked?

**Children should notice that it is much easier to wash off the marker pen with soapy water.**

Now visit [e-bug.eu/eng/EYS/lesson/Hand-Hygiene](http://e-bug.eu/eng/EYS/lesson/Hand-Hygiene) to find a NHS demonstration and the UKHSA hand washing song to help make the correct technique more memorable for little hands



## Extension Activities

### **Hand Washing and Nose Blowing Flashcards**

TS1 is a useful way to support learning. Cards can be cut and laminated for future use or displayed on a whiteboard. Ask children to name the image, the correct word is shown on the card.

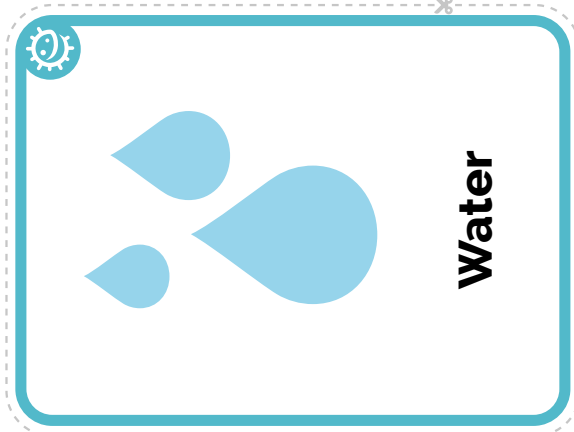
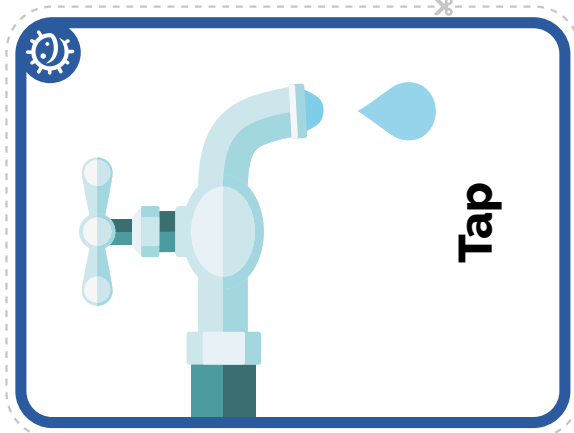
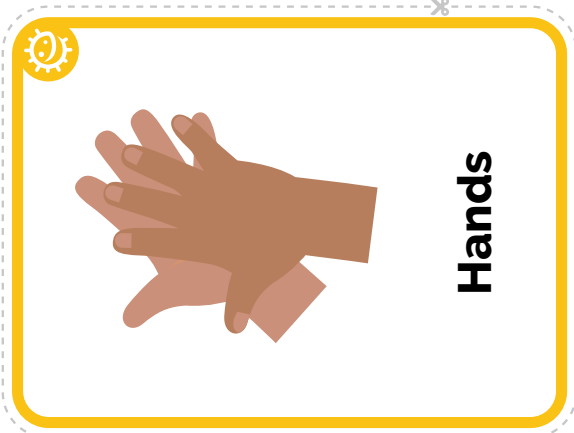
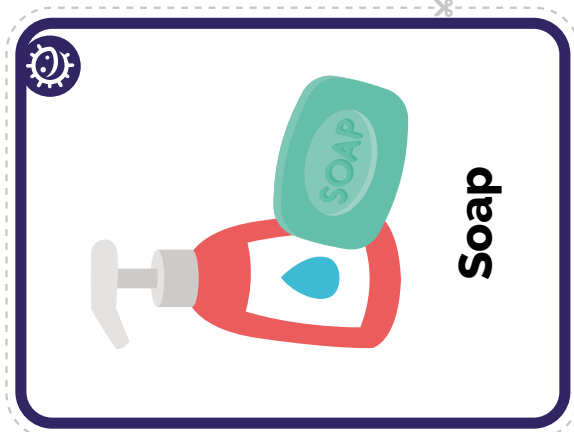
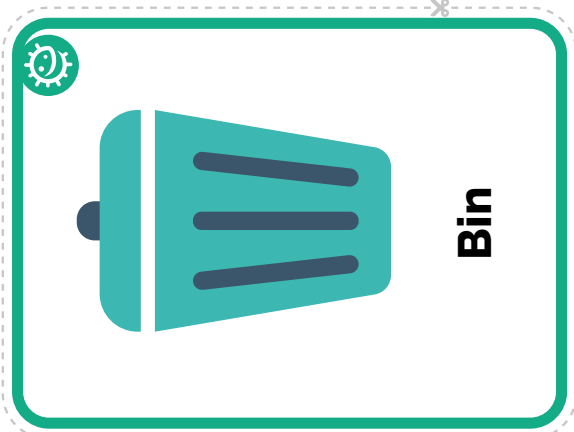
### **Picture Sequencing Activity**

Provide SW1 to a child or group. Supply paper, card and glue sticks and ask children to sort the cards into the correct order and stick them onto the paper or card with glue.

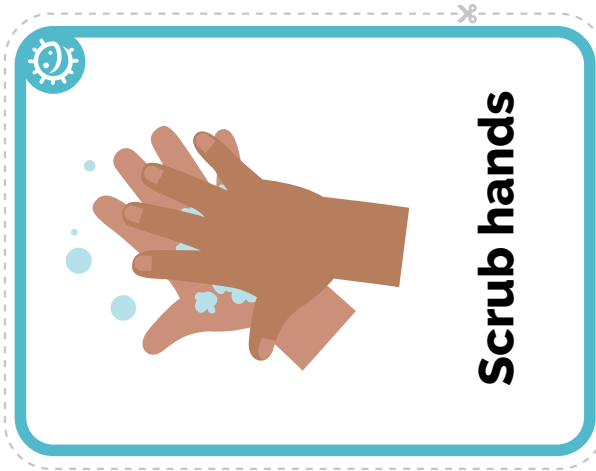
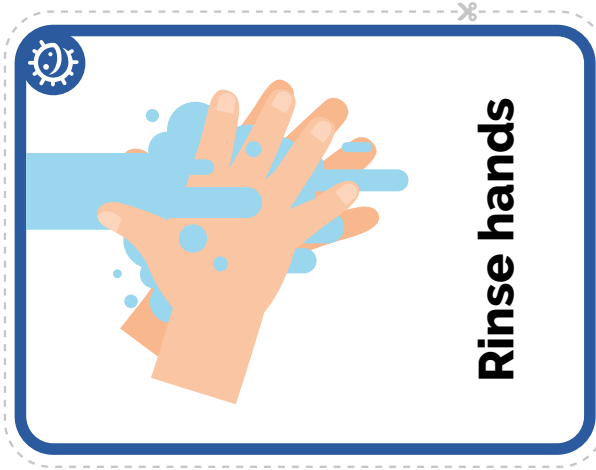
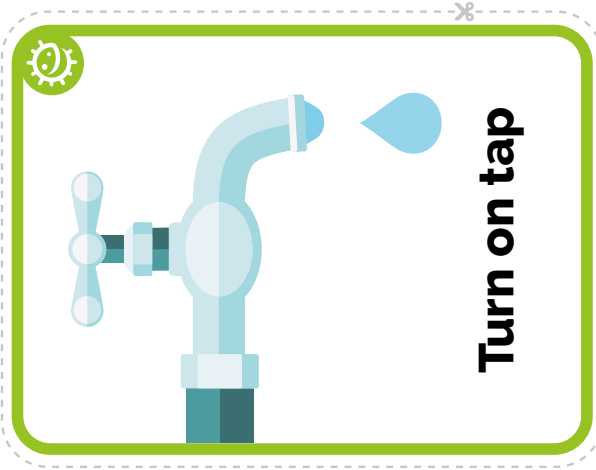
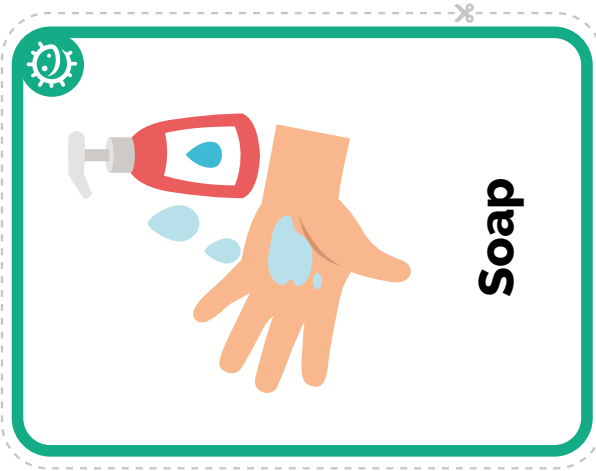
### **Hand Washing Chart**

SW2 is a useful way to encourage routine hand washing. Provide one sheet per child. Ask children to mark or draw a picture every time they wash their hands to keep track of how often they have washed their hands during one school-week. This can be completed in the classroom or at home.





SW1 - Picture Sequencing Activity – place hand washing in the correct order





# Healthy Hands

# Handwashing Chart

MON	TUE	WED	THU	FRI
-----	-----	-----	-----	-----

I washed my hands before school

--	--	--	--	--

Name

I washed my hands after breaktime

--	--	--	--	--

Class

I washed my hands before lunch

--	--	--	--	--

**Add a picture or star each time you wash your hands!**





# Spread of Infection: Respiratory Hygiene

Children learn how easily harmful germs (microbes) spread through sneezing.

## Early Years Framework links

### Communication and language development

- Listening and attention
- Understanding
- Speaking

### Physical development

- Health and self-care

### Expressive arts and design

- Exploring and using media and materials

## Key Words

Symptom, sneeze,  
Vaccinations, Microbe

## @ Weblink

[e-bug.eu/eng/EYS/lesson/  
Respiratory-Hygiene](http://e-bug.eu/eng/EYS/lesson/Respiratory-Hygiene)

## Learning Outcomes

Children will:

- Understand that sneezing into a tissue, or into your sleeve (not your hands), is the best way to stop the spread of colds and flu germs (microbes).
- Understand that there can be harmful germs in your sneezes that can spread over your hands.
- Understand the sequencing of hand washing and nose blowing.





## Resources Required

### Activity: Paint Sneezes *Per Child*

- Paper plate/sheet of paper
- Plastic/vinyl gloves
- Food colouring added to water
- Drinking straw

### Extension Activity: Hand Washing and Nose Blowing Flashcards

- TS1 Hand Washing and Nose Blowing Flashcards

### Extension Activity: Nose Blowing Writing Activity

#### *Per Child*

- SW1 Nose Blowing Writing Activity

## Advance preparation

1. You may wish to use the balloon hands from lesson 1 instead of paper plates for this main activity.
2. Create a cup of coloured water using a few drops of food colouring
3. You may wish to use different colours to indicate different germs.

## Health and Safety

Children may require aprons.

Ensure that the food colouring is diluted (to avoid staining).

Students may need to wear safety goggles.

For safe microbiological practices in the classroom consult CLEAPPS [www.cleapps.org.uk](http://www.cleapps.org.uk)

## Supporting materials

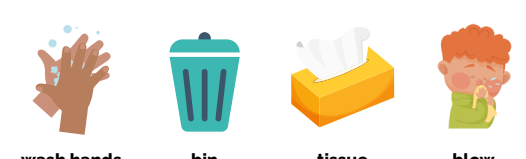


### TS1 Hand washing and nose blowing flashcards

SW1 - Nose Blowing Writing Activity

### Blowing Your Nose Writing Activity

Write instructions for the correct way to blow your nose. Use the pictures below to help you.



wash hands      bin      tissue      blow

### SW1 Nose blowing writing activity

# Lesson Plan



## ☰ Introduction

1. Begin by explaining to the children that they are going to learn how harmful microbes can be spread by sneezing and coughing.
2. Discuss that colds and flu are caused by harmful microbes (viruses). The viruses can be passed on to other people if we cough or sneeze on them or if we cough and sneeze on to our hands and then touch them.

## 🗨️ Discussion

Discuss with children what happened. Ask them to look at the hand and notice that the microbes are still on it.

Microbes can still be passed from person to person through touch if we cover our coughs and sneezes with our hands. It is recommended that in the absence of a tissue we sneeze on our sleeve/elbow because we are less likely to transmit harmful microbes to other people by doing this.

Explain that sneezing in your hand can spread the microbes to things that we touch, so it is better to sneeze into the tissue (or our sleeve/elbow) and then throw it away and wash your hands as soon as possible.

## Activity: Paint Sneezes

1 Use a pen to draw around your hand onto a paper plate or a sheet of paper



2 Add drops of coloured water to the drawn hand



3 Blow the water all over the drawn hand



4 What do you see?



1. Ask the group to use a pen to draw around their hand onto a paper plate or a sheet of paper.
2. Add a few drops of coloured water to each child's drawn hand.
3. Give each child a drinking straw and ask them to blow the germs all over their drawn hand just like they would blow germs out of their nose onto their hands.
4. Children may wish to decorate the germs or give them names.
5. Discuss with the children what would happen if we cover our mouth with a tissue or our sleeve instead of our hands when sneezing and how this would limit the spread of germs.

**Children should notice that the coloured water spreads over their drawn hand more readily when they don't cover their mouth.**

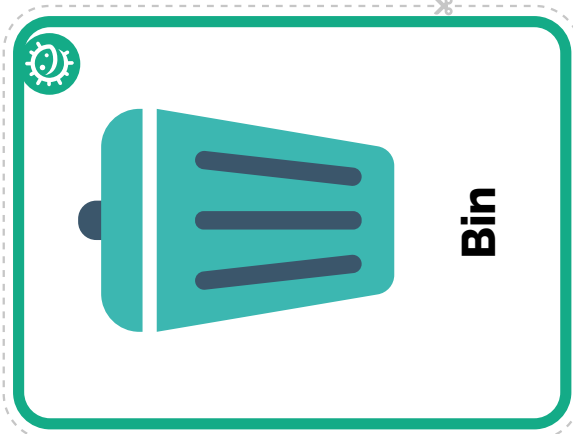
## Extension Activities

### Hand Washing and Nose Blowing Flashcards

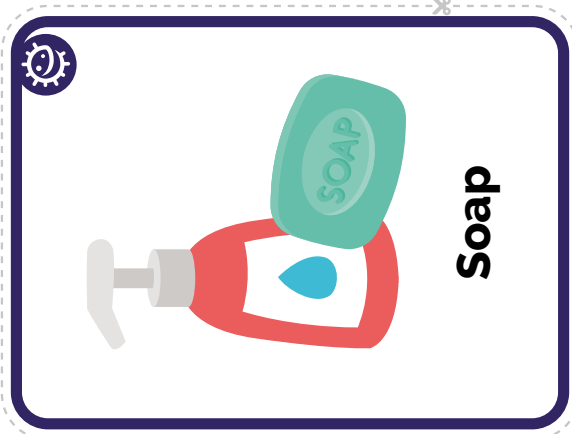
TS1 can be used to support learning. Print the sheet and cut out the flashcards, or display the sheet on a whiteboard. Ask children to name the image, the correct word is shown on the card

### Nose Blowing Writing Activity

Provide each child with SW1. Ask children to use the picture prompts and words provided to fill in the blanks for the correct steps to take when blowing your nose.



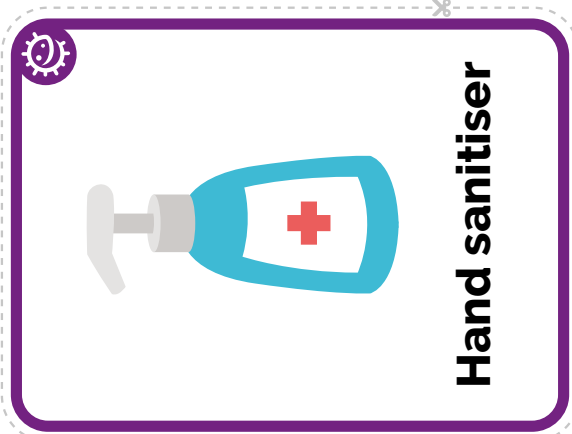
**Bin**



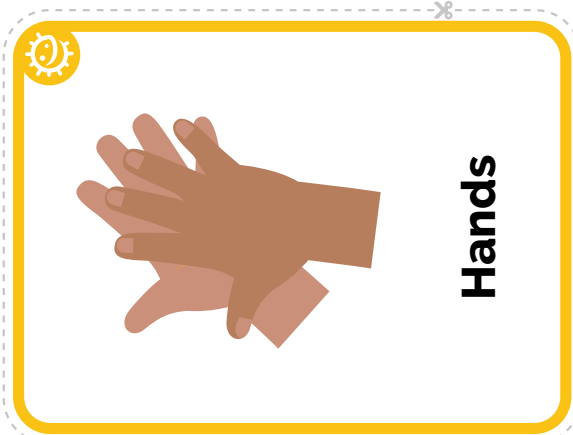
**Soap**



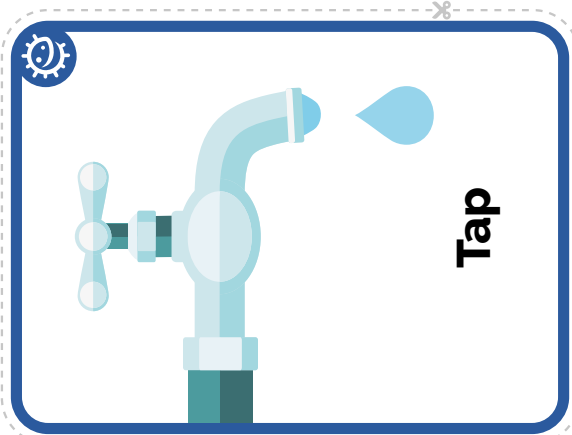
**Tissue**



**Hand sanitiser**



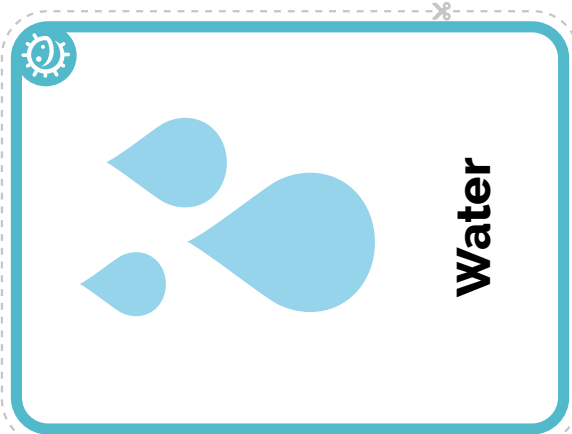
**Hands**



**Tap**



**Sneeze**



**Water**





# Blowing Your Nose Writing Activity

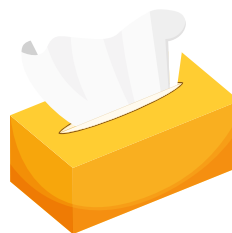
Write instructions for the correct way to blow your nose.  
Use the pictures below to help you.



**wash hands**



**bin**



**tissue**



**blow**

**Step 1**

**Step 2**

**Step 3**

**Step 4**





# Prevention of Infection: Oral Hygiene

Children learn how to brush their teeth and understand that we brush our teeth at least twice per day to avoid tooth decay.

## Early Years Framework links

### Communication and language development

- Listening and attention
- Understanding
- Speaking

### Physical development

- Health and self-care

### Expressive arts and design

- Exploring and using media  
and materials

## Key Words

Bacteria, Germs, Microbes, Plaque,  
Cavity, Sugar, Tooth brushing.

## @ Weblink

[e-bug.eu/eng/EYS/lesson/  
Oral-Hygiene](http://e-bug.eu/eng/EYS/lesson/Oral-Hygiene)

## Learning Outcomes

Children will:

- Understand how to brush their own teeth effectively.
- Understand why it is important to brush our teeth.
- Understand the link between sugar and tooth decay.



## Resources Required

### Introduction

*Per class*

- SH1 Picture of teeth

### Activity: Mirror Exercise and Teeth Brushing Mime

*Per class*

- Soft toy / puppet or mouth model with an opening mouth and teeth
- Toothbrush
- Mirror
- A timer / 2-minute egg timer
- If possible, ask children to bring a toothbrush to the session

### Activity: Mirror Exercise and Teeth Brushing Mime

*Per child*

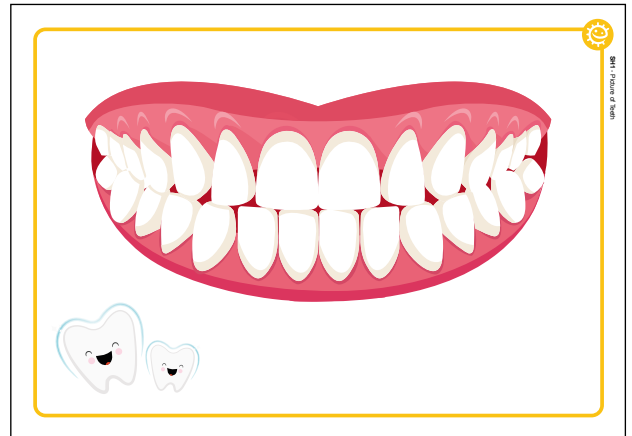
- SW1 Teeth Brushing Chart

## Health and Safety

Younger children must be supervised when brushing their own teeth at all times

For safe microbiological practices in the classroom consult CLEAPPS [www.cleapps.org.uk](http://www.cleapps.org.uk)

## Supporting materials



SH1 Picture of Teeth

	MON	TUE	WED	THU	FRI
<b>Healthy Teeth Brushing Chart</b>					
I cleaned my teeth in the morning					
Name					
I cleaned my teeth before bed					
Class					
I cleaned my teeth for 2 minutes					
Add a picture or star each time you brush your teeth					

SW1 Teeth Brushing Chart

# Lesson Plan



## ☰ Introduction

1. Ask the children to use a mirror to look in their mouth. What can they see? How many teeth can they see? What do they look like? Explain to the children that most of their teeth are baby teeth, but some children's teeth may have started to fall out, these are replaced by bigger adult teeth that they will have for the rest of their lives.
2. Show the class SH1 a picture of teeth inside a mouth. SH1 is a picture of adult teeth, which has 28 teeth excluding 4 wisdom teeth. Adults have a total of 32 teeth. Ask the children to help count the number of teeth they see in the picture. Then ask the children to count how many teeth they have (children under 6 generally have 20 baby teeth). Ask the children how many top teeth they have and how many bottom teeth they have.
3. Ask the children what we use our teeth for (eating, speaking, smiling). Explain that it is very important to look after our teeth by keeping them clean. Having too many sugary foods and drinks too often is bad for our teeth and could cause holes in our teeth, this is called a cavity. A cavity can hurt and make it painful to eat. Brushing your teeth helps prevent cavities.
4. Explain to the children that to keep our teeth healthy we must brush them twice every day; last thing at night and at least one other time during the day, it's easy to remember if you do it before school and before bed. Tell the children that we should brush our teeth for two minutes each time, using a fluoride toothpaste and be supervised/get help from an adult.



## Activity: Mirror Exercise and Teeth Brushing Mime

1 Open your toy or puppet's mouth



2 Brush your toy or puppet's teeth in circles



1. Bring out either a soft toy or puppet with an open mouth and teeth and explain to the children that they are going to brush the puppets teeth.
2. Using the puppet and a toothbrush, show the children how to brush their teeth, demonstrating the action of moving the toothbrush in small circles on the front and the back of the teeth, and all the way back to the molars.
3. If you have extra puppets and toothbrushes let the student try this themselves along with a two-minute timer. If only one puppet/brush is available you can share the puppet and toothbrush among the group, and have each child pass it on after 15 – 30 seconds.
4. If children have brought their own toothbrushes to school, supervise the children brushing their own teeth.

**This fun activity will help children learn to brush their teeth effectively.**

## Extension Activities

### Teeth Brushing Chart

SW2 is a useful way to encourage routine tooth brushing. Provide one sheet per child. Ask children to mark or draw a picture every time they brush their teeth to keep track of how often they have brushed their teeth during one school week. This can be completed in the classroom or at home.



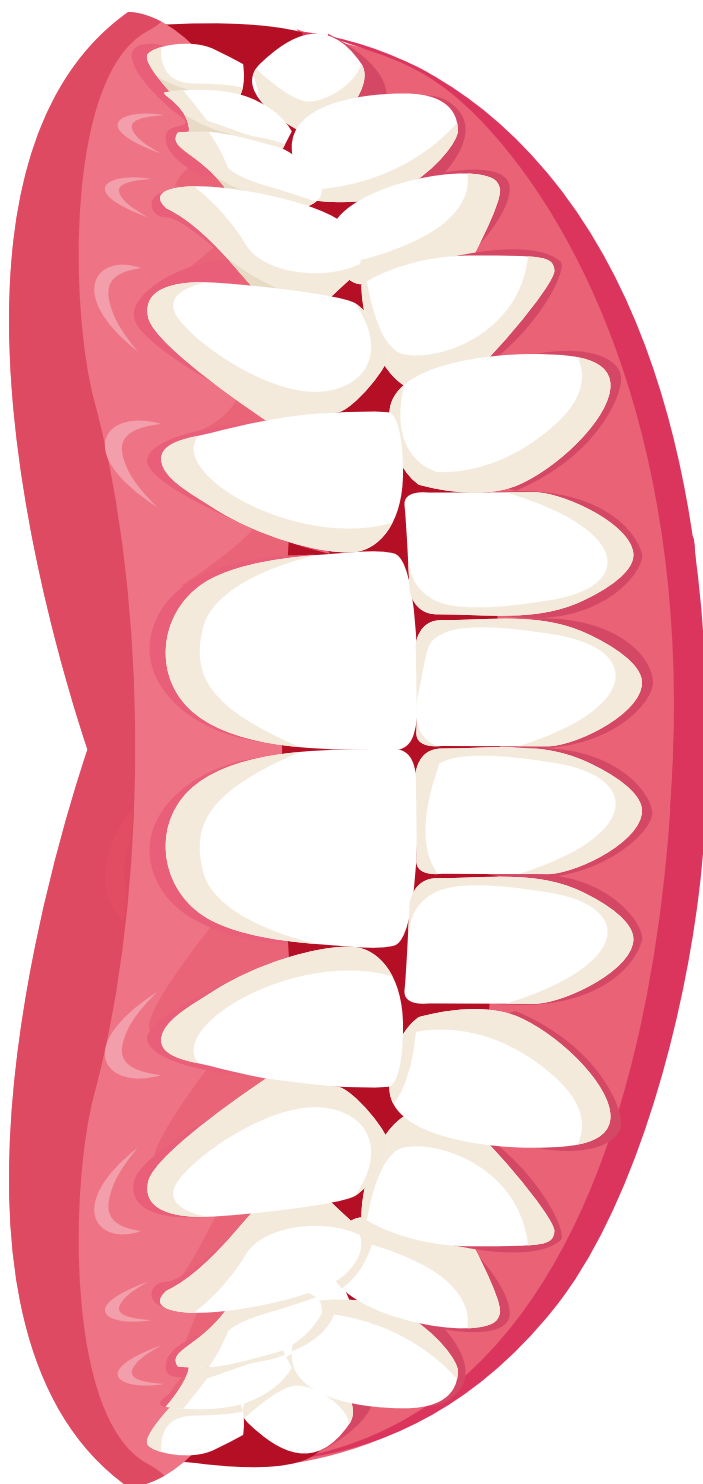
## Discussion

Tell the students we brush our teeth to remove germs (microbes) that live in our mouths and like to eat the sugar on our teeth. When this happens and we don't brush our teeth enough we can get holes in our teeth which might get worse over time and cause toothache or worse and can make you feel unwell.

Ask the children if they can remember the most important steps to keep our teeth clean:

1. Brush twice a day - before school and just before bed.
2. Using a fluoride toothpaste.
3. Brush your teeth in circles and get the front, back and molars.
4. Brush for two-minutes.
5. Spit out the toothpaste at the end, do not rinse.







# Healthy Teeth Brushing Chart

MON

TUE

WED

THU

FRI

I cleaned my teeth in the morning

Name

I cleaned my teeth before bed

Class

I cleaned my teeth for 2 minutes

**Add a picture or star each time you brush your teeth**



# **Key Stage 1 Lesson Plans**

**All lesson plans  
and supporting  
materials  
contained in this  
pack are available  
to download  
as modifiable  
templates from  
the e-Bug website**





# Introduction to Micro-organisms

This lesson is designed to introduce students to viruses, bacteria and fungi. The introductory activity allows students to combine their observational and creative skills to make a microbe of their own choice, exploring various microbial types and shapes.

## Curriculum Links

### Science

Working scientifically, Living things and their habitats

### PSHE/RSHE

Health and prevention

### English

Reading and comprehension, Writing

## Key Words

Fungi, Bacteria, Viruses, Cocci, Bacilli, Spiral, Penicillium, Lactobacilli

## Weblinks

[e-bug.eu/eng/KS1/lesson/Introduction-to-Microbes](http://e-bug.eu/eng/KS1/lesson/Introduction-to-Microbes)

## Learning Outcomes

All students will:

- Understand there are three different types of microbes: viruses, bacteria and fungi.
- Understand microbes are all different shapes and sizes.
- Understand some microbes are useful but some can be harmful.

Most students will:

- Understand microbes are found everywhere.
- Understand most microbes are too small to be seen with the naked eye.

## Resources Required

### **Activity: Modelling Microbes** *Per group*

- Coloured modelling clay (follow TS1 for a home-made recipe)
- Permanent black marker
- SH1 Making Microbes Guide
- SH2 Microbes Fun Fact Sheet
- SH3-5 Microbe Example Sheets

### *Per student*

- Petri dishes (optional)

### **Extension Activity:** **Yes or No Cards**

#### *Per class/group*

- SW1 Yes or No Cards
- TS2 Yes or No Answers

### **Extension Activity:** **Microbe Flashcards**

#### *Per class/student*

- SW2 Microbes Flashcards

### **Extension Activity: Fill in the Blanks Worksheet**

#### *Per group*

- SW3 Microbe Mania Fill in the Blanks Worksheet

The modelling clay activity can be carried out using arts and craft materials you may already have in your classroom, or by drawing the microbes.

## Advance Preparation

For the main activity students will be making microbes out of modelling clay. Use the Making Microbes Guide (SH1), Microbe Mania Fun Fact Sheet (SH2) and Microbe Example Sheets (SH3-5) for inspiration. Provide each student group with modelling clay, Petri dishes (if using), images and information about microbes.

## Health and Safety

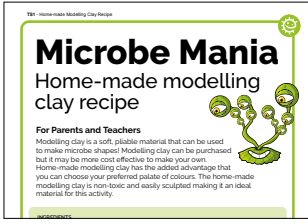
Take care that modelling clay is non-toxic and suitable for students.

Take care that students do not eat the modelling clay.

For safe microbiological practices in the classroom consult CLEAPPS [www.cleapps.org.uk](http://www.cleapps.org.uk)



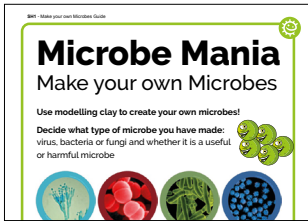
# Supporting Materials



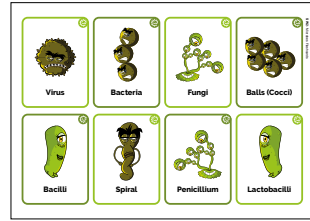
TS1 Home-made Modelling Clay Recipe



SW1 "Yes" and "No" cards



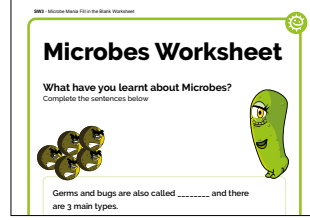
SH1 Making Microbes Guide



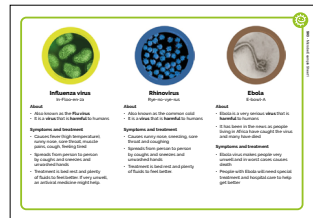
SW2 Microbes Flashcards



SH2 Microbe Mania Fun Fact Sheet



SW3 Microbes Mania Fill in the Blank Worksheet



SH3 Microbe Example Sheets

(SH4-5 available online)





# Lesson Plan



## Introduction

1. Begin the lesson by asking students if they know what microbes are. Explain that they are tiny living things that are all around us. Most of these are too small to be seen with our eyes.
2. Ask the students if they, or anyone in their family, has ever been poorly with a cough, cold or a temperature? What do they think caused it? Explain to the students that some illnesses called infections, are caused by these tiny living things called microbes. Explain that there are three different types of microbes: viruses, bacteria and fungi.
3. Emphasise that although some microbes make us ill, there are also useful microbes. Tell the students that bacteria help to make foods like yoghurt, and fungi like yeast help make bread while other fungi are used as medicines.
4. Highlight to the class that microbes can be found EVERYWHERE: floating around in the air we breathe, on the food we eat, on the surface of our bodies, in our mouth, nose and gut/tummy, most of these are not harmful and some are good for us.

## Discussion

Discuss the microbes the students made highlighting the differences between viruses, bacteria and fungi.

If you have used the extension activity, SW1 Yes and No cards, discuss the answers with the students. Explain that not all microbes make us poorly.

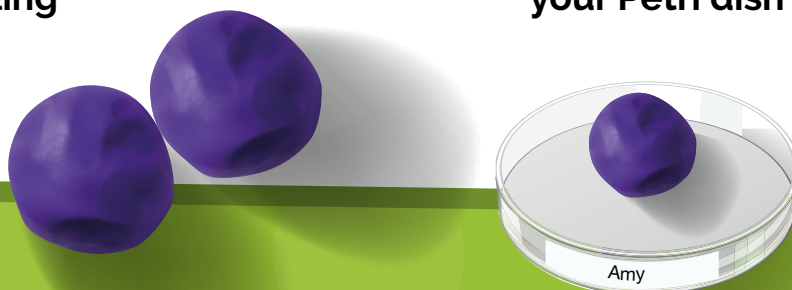
## Activity: Modelling Microbes

**1 Shape your microbe using modelling clay**

**2 Place into your Petri dish**

**3 Write the name of your microbe on your Petri dish**

**4 Take your Petri dish home**



This activity aims to introduce students to different types of microbes and microbe shapes by allowing them to make a microbe out of modelling clay. This activity also introduces students to terms associated with microbes that they may come across day-to-day e.g. germs, bugs.

1. Remind the students that there are three different types of microbes (viruses, bacteria and fungi) and how these are different.
2. Encourage students to make microbes using modelling clay and to place them in a Petri dish (if using). They can use the images from SH1 and SH3-5, and information about microbes on SH2 as inspiration.
3. Point out common forms of microbes that they might have heard of to get them started.
4. Ask them which microbe they are making and to describe it e.g. is it a virus, fungi or bacteria and is it useful or harmful?

5. When they have finished, ask students to write what they have made on the Petri dish with the permanent black marker. Students can take the dish home.

## Extension Activities

### Yes or No cards

As a class activity or in groups of 3 or 4 provide SW1 Yes or No cards or display them on a whiteboard. Ask students to answer yes or no to the questions provided. Answers can be found in TS2 on the e-Bug website.

### Microbe Flashcards

SW2 can be used to support learning. Print the sheet and cut out the flashcards, or display on a whiteboard. Ask students to name the image, the correct word is shown on the card.

## Fill in the Blanks Worksheet

SW3 requires students to fill in the blanks using the correct words provided. Provide one worksheet per student to help test their knowledge of microbes.

### Fascinating Fact

Micro-organisms first appeared on earth about 3.5 billion years ago and are essential to sustain life on our planet.

## Learning Consolidation

At the end of the lesson, ask the class the following questions as a fact checking exercise.

- What are the three different types of microbes?

Answer: Viruses, bacteria and fungi

- Microbes can be beneficial to us e.g. yeast, can be used to make bread rise. What type of microbe is yeast?

Answer: Fungus

- True or false? Microbes are invisible to the naked eye and come in different shapes and sizes.

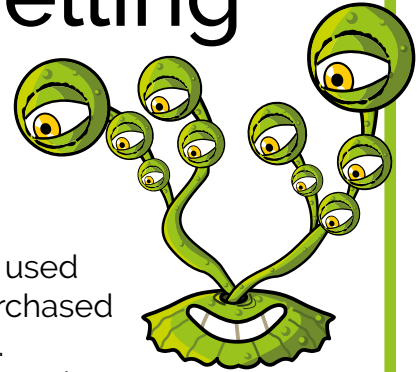
Answer: True





# Microbe Mania

## Home-made modelling clay recipe



### For Parents and Teachers

Modelling clay is a soft, pliable material that can be used to make microbe shapes! Modelling clay can be purchased but it may be more cost effective to make your own.

Home-made modelling clay has the added advantage that you can choose your preferred palate of colours. The home-made modelling clay is non-toxic and easily sculpted making it an ideal material for this activity.

#### INGREDIENTS

- 1 cup of plain flour
- 2 teaspoons of cream of tartar
- 1 cup of water
- 1 tablespoon of vegetable oil
- 1/2 cup of salt
- Food colouring

### Method

1. Mix together the dry ingredients
2. Add the water and mix until smooth
3. Add the food colouring followed by the vegetable oil
4. Cook on a medium heat, stirring constantly, until the dough leaves the side of the pan in a ball  
Alternatively, microwave the mixture on a high setting for 4 minutes, stirring every 30 seconds
5. Allow to cool before use
6. Store in a plastic bag or wrapped in cling film to stop the modelling clay drying out



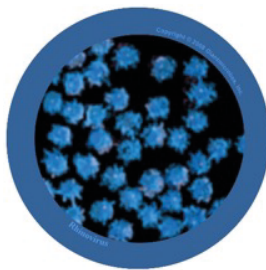
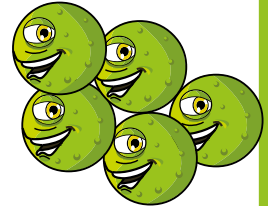


# Microbe Mania

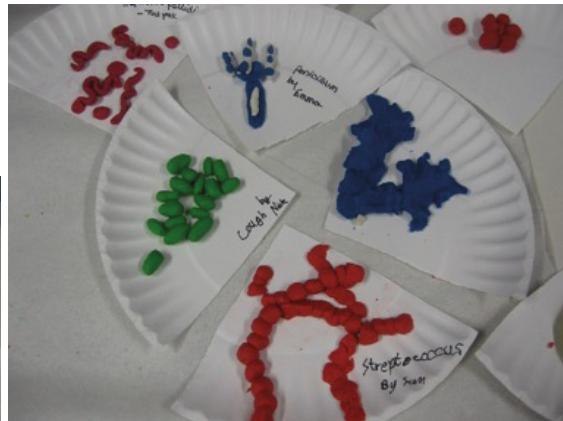
## Make your own Microbes

Use modelling clay to create your own microbes!

Decide what type of microbe you have made:  
virus, bacteria or fungi and whether it is a useful  
or harmful microbe



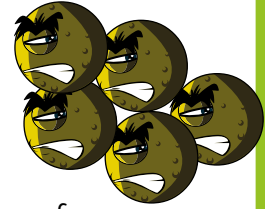
Photos copyright 2008 Giantmicrobes, inc.





# Microbe Mania

## Fact sheet



### What is a microbe?

Microbes are also called germs or bugs. There are three types of microbes: bacteria, viruses and fungi. Some microbes can make us ill, but most are very useful to us.

### Where are microbes found and what do they look like?

Microbes are found everywhere. They come in all shapes and sizes.



### Make your own microbes

Use modelling clay to create your own microbes.

Decide what type of microbe you have made:

Fungi, bacteria or virus, and whether it is a useful or harmful microbe

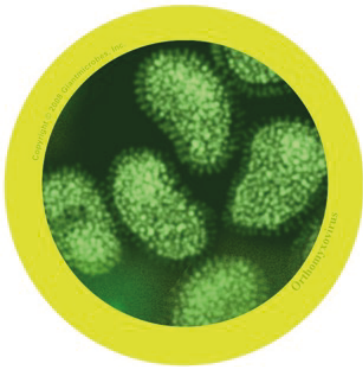
For ideas, download pictures of microbes from [www.e-bug.eu](http://www.e-bug.eu). Ask an adult to help you make your own modelling clay, using the TS1 recipe.

### Surprise your friends and family with these fun facts!

**DID YOU  
KNOW?**

- There are more microbes on the planet than any other type of living thing.
- Microbes are the oldest form of life on Earth. They've been here for 4 billion years.
- Microbes are found everywhere on Earth, even inside volcanoes.
- Some microbes can glow in the dark. People once used glowing pieces of fungus growing on wood to light their way.
- Humans would not be able to live without microbes. Some microbes produce oxygen which we need to breathe and others help plants to grow which we eat.





### Influenza virus

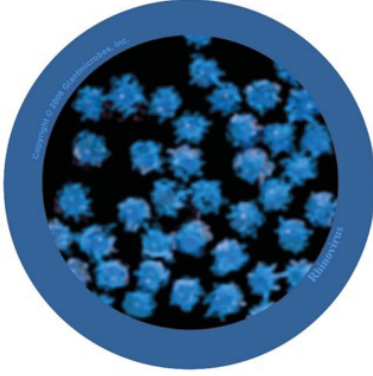
In-Floo-en-Za

#### About

- Also known as the **Flu virus**
- It is a **virus** that is **harmful** to humans

#### Symptoms and treatment

- Causes fever (high temperature), runny nose, sore throat, muscle pains, cough, feeling tired
- Spreads from person to person by coughs and sneezes and unwashed hands
- Treatment is bed rest and plenty of fluids to feel better. If very unwell, an antiviral medicine might help.



### Rhinovirus

Rye-no-vye-rus

#### About

- Also known as the common cold
- It is a **virus** that is **harmful** to humans

#### Symptoms and treatment

- Causes runny nose, sneezing, sore throat and coughing
- Spreads from person to person by coughs and sneezes and unwashed hands
- Treatment is bed rest and plenty of fluids to feel better.



### Ebola

E-bowl-A

#### About

- Ebola is a very serious **virus** that is **harmful** to humans
- It has been in the news as people living in Africa have caught the virus and many have died

#### Symptoms and treatment

- Ebola virus makes people very unwell and in worst cases causes death
- People with Ebola will need special treatment and hospital care to help get better





**Most microbes  
can be seen with  
the naked eye**

**Yes or No**



**Microbes always  
make us poorly**

**Yes or No**



**Microbe is  
another name for  
bugs and germs**

**Yes or No**



**Most colds are  
caused by viruses**

**Yes or No**







**If you become  
poorly because of  
a microbe, this is  
called an infection**

**Yes or No**



**You only find  
microbes on things  
that are dirty, like  
the toilet**

**Yes or No**



**Bacteria are used  
to make yoghurt**

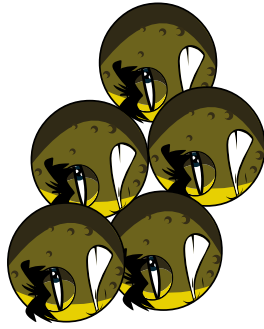
**Yes or No**



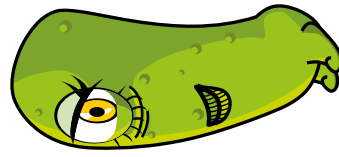
**Most microbes  
do not effect us  
in any way**

**Yes or No**

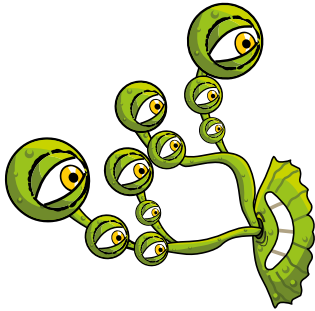




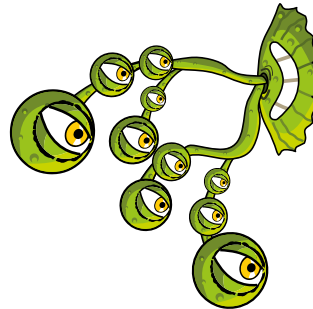
**Balls (Cocci)**



**Lactobacilli**



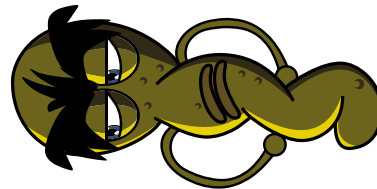
**Fungi**



**Penicillium**



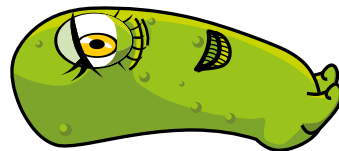
**Bacteria**



**Spiral**



**Virus**



**Bacilli**

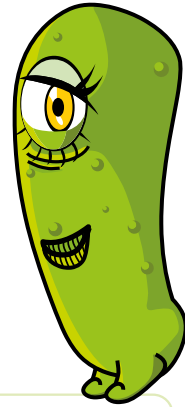
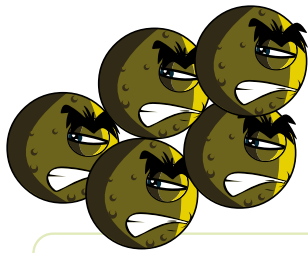




# Microbes Worksheet

## What have you learnt about Microbes?

Complete the sentences below



Germs and bugs are also called \_\_\_\_\_ and there are 3 main types.

The smallest Microbe is a \_\_\_\_\_ and they can make us poorly with a cough or a cold.

The largest Microbe is a \_\_\_\_\_ we use this to make bread.



Balls, rods and spirals are the 3 main shapes of \_\_\_\_\_.

Microbes are found \_\_\_\_\_ and even in volcanos!





# Spread of Infection: Hand Hygiene

By taking part in a classroom experiment students will understand how soap or sanitisers work and that hand washing is the best way to remove microbes.

## Curriculum Links

### Science

Working scientifically, Living things and their habitats

### PSHE/RSHE

Health and prevention

### English

Reading and comprehension, Writing

## Key Words

Hygiene, Soap, Hand washing, Microbes

## @ Weblink

[e-bug.eu/eng/KS1/lesson/Hand-Hygiene](http://e-bug.eu/eng/KS1/lesson/Hand-Hygiene)

## Learning Outcomes

All students will:

- Understand washing hands can help remove microbes.
- Understand washing hands is one of the best ways to prevent the spread of microbes.
- Understand washing hands with soap and water is better than washing hands with water alone.



## Resources Required

### Activity: Pepper and Water Experiment

#### *Per group*

- Small plastic bowls
- Water
- Washing up liquid
- Pepper
- Cocktail sticks

### Extension Activity: Healthy Hands Fact Sheet

#### *Per student*

- SH1 Healthy Hands Fact Sheet

### Extension Activity: Hand Washing Flashcards

#### *Per class*

- SW1 Hand Washing Flashcards

### Extension Activity: Fill in the Blank Worksheet

#### *Per student*

- SW2 Healthy Hands Fill in the Blank Worksheet

## Advance preparation

Set up a few bowls of water with pepper sprinkled on the surface, a few plain bowls of water, and another bowl with washing up liquid in.

## Health and Safety

Ensure that the demonstrating students have no soap allergies or sensitive skin conditions

For safe microbiological practices in the classroom consult CLEAPPS [www.cleapps.org.uk](http://www.cleapps.org.uk)

## Supporting materials



### SH1 Healthy Hands Fact Sheet



### SW1 Hand Washing Flashcards



### SW2 Healthy Hands Fill in the Blank Worksheet

# Lesson Plan



## Introduction

1. Begin the lesson by asking the students if they know why we wash our hands. Explain that we wash our hands to not only remove any dirt and grime that we can see, but also to remove germs (microbes) that we cannot see.
2. Explain to students that because we use our hands all the time they pick up millions of germs (microbes) every day. Although many of these are harmless some could be harmful and might make us ill.
3. Explain that our skin is naturally covered in oils and that this oil helps microbes 'stick' to our skin. This means we need to wash our hands properly with both soap and water to be able to wash away the germs from our hands. If no soap is available, hand sanitiser gels can also remove germs from our hands.
4. Explain to the students that they are now going to complete an activity to show them why soap is important when we wash our hands.

## Discussion

Can the students answer the question: Why do we use soap to wash our hands?

Discuss where germs (microbes) on their hands may have come from. Emphasise to students here that not all the germs on their hands are harmful; there may also be useful microbes there too.

Discuss what happened with and without the soap with the students. Explain why using soap when you wash your hands is important - because it breaks up the oils on the surface of your hands that microbes stick to, and they can be rinsed away under running water. Without soap, the oils are not removed, and microbes find it easier to stick.

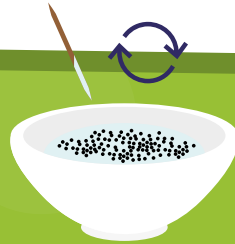
Emphasise to students that we also need to wash hands properly. Highlight that microbes like to hide in between fingers and under the nails. It is important to know both WHEN and HOW to wash hands properly to prevent harmful microbes and potentially infection.

## Activity: Pepper and Water Experiment

**1 Dip the cocktail stick into the plain water**



**2 Dip the cocktail stick into the pepper water and swirl the stick around**



**3 Dip the cocktail stick into the washing up liquid then back into the pepper water**



This activity shows how washing with soap and water is better than using water alone. Demonstrators should help students with cocktail sticks to ensure safety. The bowls must be rinsed after each group for this activity to be effective.

1. Explain to the class that the surface of the water in the bowls represents their hands, and that the pepper represents harmful microbes that need to be washed away.
2. Dip the end of a cocktail stick into the plain bowl of water and then into the pepper water. Gently swirl the cocktail stick around and explain that using water to wash your hands only moves the microbes around.
3. Dip the cocktail stick into the bowl of washing up liquid and then into the pepper water.
4. The pepper (microbes) will move towards the edges of the bowl as the soap hits the surface of the water.
5. Explain to the class that the soap breaks up the oil on our hands. The microbes can then be washed away when we rinse the soap off hands with water.

Now visit [e-bug.eu/eng/ks1/lesson/Hand-Hygiene](https://e-bug.eu/eng/ks1/lesson/Hand-Hygiene) to find a NHS demonstration and UKHSA hand washing song to help make the correct technique more memorable for little hands.



## Extension activity

### Healthy Hands Fact Sheet

Provide each student with a copy of SH1 to consolidate the session. Students can learn and share Healthy Hands facts with family and friends.

### Hand Washing Flashcards

SW1 can be used to support learning. Print the sheet and cut out the flashcards, or display on a whiteboard. Ask children to explain the image, the correct words are shown on the card.

### Fill in the Blank Worksheet

Provide each student with SW2. Ask students to name the image to complete the sentence. Students can re-write the completed sentence or read it out loud.

## Learning Consolidation

At the end of the lesson, ask the class to complete the following sentences with their own answers.

- A song to use when washing my hands is: \_\_\_\_\_
- I will wash my hands at key moments during the day, for example: \_\_\_\_\_
- There are \_\_\_\_ steps to wash every part of my hands.
- If I am not able to wash my hands with soap and water, I will use \_\_\_\_\_







# Healthy hands

## Fact sheet

### What makes our hands dirty?

We get microbes on our hands from everything that we touch like door handles, school desks, the floor or our pets. We also get microbes on our hands when we hold hands, pick our nose or sneeze into our hands.

### Why should we wash our hands?

We wash our hands to get rid of harmful microbes that might make us poorly. It is important that we wash our hands after using the toilet, before eating or cooking, after stroking animals or after coughing or sneezing.

### Surprise your friends and family with these fun facts!

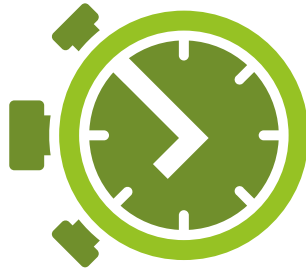
**DID YOU  
KNOW?**

- Most microbes on our hands are under our fingernails.
- Nearly everyone says they wash their hands after using the toilet, but more than half don't. Just think what may be on their hands.
- Most toilet handles have 400 times more microbes than the toilet seat.
- There are more microbes on one person's hand than people on the planet.
- Hand washing is the best way to stop microbes spreading.
- Some microbes can stay alive on our hands for up to three hours.





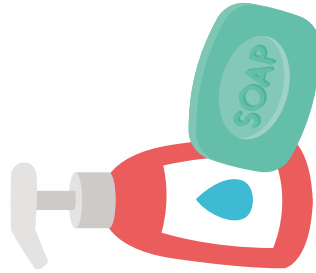
**Back  
of fingers**



**20 seconds**



**Between  
fingers**



**Soap**



**Backs  
of hands**



**Tips  
of fingers**



**Scrub  
your hands**



**Thumbs**



Turn the



to run the



Put



on your



Rub your



together



Rinse your



with



Turn off the



dry



Throw the paper towel in the





# Spread of Infection: Respiratory Hygiene

In this fun experiment students learn how easily microbes can be spread through coughs and sneezes and recreate a sneeze.

## Curriculum Links

### Science

Working scientifically, Living things and their habitats

### PSHE/RSHE

Health and prevention

### English

Reading and comprehension,  
Spoken language

### Mathematics

Comparing measurements

## Key Words

Bacteria, Hygiene, Micro-organism,  
Sneeze, Cough, Hand wash,  
Hand sanitiser.

## @ Weblink

[e-bug.eu/eng/KS1/lesson/  
Respiratory-Hygiene](http://e-bug.eu/eng/KS1/lesson/Respiratory-Hygiene)

## Learning Outcomes

All students will:

- Understand there can be harmful microbes in our coughs and sneezes.
- Understand that infection can be spread through coughs and sneezes.
- Understand that good respiratory hygiene can reduce the spread of infection.

Most students will:

- Understand that we can spread infection through touching surfaces after touching/wiping our nose or holding a cough/sneeze.
- Understand how to develop best practice respiratory hygiene behaviours in everyday life to reduce the spread of infection.

## Resources Required

### Activity: Snot Runway

#### Per group

- Long roll of paper such as wallpaper
- Measuring tape or 2m ruler
- Pump action spray bottle/s
- Green food colouring
- Disposable plastic/vinyl gloves
- Kitchen roll
- Pens and sticky notes (optional)
- A funny mask to cover the spray bottle (optional)
- Cardboard

### Extension Activity: Fact Sheet

#### Per student

- SH1 Super Sneezes Fact Sheet

### Extension Activity: Super Slimy Snot Activity

#### Per student

- SH2 Super Slimy Snot Activity

### Extension Activity: Super Sneezes Wordsearch

- SW1 Super Sneezes Wordsearch

### Extension Activity: Fill in the Blank Worksheet

- SW2 Super Sneezes Fill in the Blank Worksheet

## Advance preparation

1. Create a paper runway on the floor or by placing 3 – 4 desks in a row and covering them with white paper (lining wallpaper is a cheap alternative).
2. Fill one spray bottle per group with water and food colouring.

3. Create a large cardboard cut out hand for each group with a longer arm section for holding or alternatively cover a student's hand with a disposable glove.
4. Create a large tissue from a section of kitchen roll.

## Health and Safety

Students may require aprons.

Ensure that the food colouring is dilute (to avoid staining).

Ensure that all spray bottles have been thoroughly cleaned and rinsed prior to use.

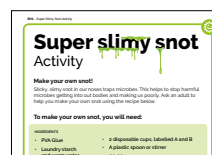
Students may need to wear safety goggles.

For safe microbiological practices in the classroom consult CLEAPPS [www.cleapps.org.uk](http://www.cleapps.org.uk)

## Supporting Materials



SH1 Super Sneezes Fact Sheet



SH2 Super Slimy Snot Activity (available online)



SW1 Super Sneezes Wordsearch



SW2 Super Sneezes Fill in the Blank Worksheet

# Lesson Plan



## Introduction

1. Begin the lesson by explaining to students that they are going to learn how harmful microbes (germs) can make us poorly and are passed from person to person through coughing and sneezing.
2. Explain to students that many harmful microbes can travel in tiny droplets of mucus/snot and water coughed and sneezed into the air by people. If you are carrying out the Super Slimy Snot Activity (SH2) it is useful to refer to that here. You can use examples like the common cold or flu.
3. Continue to discuss a cold, or flu, explaining that they are caused by very small microbes called viruses.
4. Explain that it is very important for everyone's health that people cover their mouth and nose with a tissue when they cough and sneeze, or with their sleeve/into the crook of their elbow if they have no tissue. They should then wash their hands or use hand gel.

## Discussion

Explain that sneezing in your hand can spread the microbes to things that we touch, so it is better to sneeze into the tissue and then throw it away and wash your hands or use hand sanitiser as soon as possible.

Discuss with the class what happened. You may want to show the glove or hand that covered the cough/sneeze and notice that the spray germs (microbes) are still on it. Show the students that when they place the hand on the paper, sprayed side down, the microbes transfer to the paper.

As was observed from the activity, microbes can still be passed from person to person through touch if we cover our coughs and sneezes with our hands. Recent guidance recommends we sneeze or cough into our elbow or sleeve because we are less likely to transmit harmful microbes to other people by doing this.

## Activity: Snot Runway

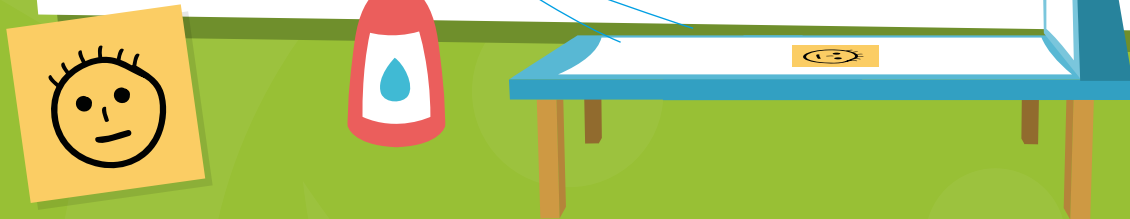
1 Write your name or draw a picture of yourself on sticky note and place on runway

2 Spray the bottle from end of runway

3 Measure the distance

4 Spray the bottle with hand or glove over nozzle

5 Spray the bottle with kitchen towel over nozzle



1. Ask the group to write their name or draw a picture of themselves on a sticky note (or write directly on the runway). Ask the group to imagine that the runway is a bus and the students can place themselves where they think they will avoid the germs from the cough/sneeze.
  2. Hold the bottle at the end of the sneeze runway and simulate a sneeze/cough by squeezing the trigger while everyone shouts 'ACHOO'. You can then work out who was closest to the actual distance by measuring the distance between the spray droplets and the student's name or picture of themselves. You may wish to repeat to allow all students to have a go.
  3. Ask a student to measure how far and how wide the cough/sneeze spreads with a meter ruler or tape measure and determine which student guessed the closest.
  4. Ask the group what you would usually do when sneezing or coughing – put a hand over your nose.
  5. Ask one student to put on a glove and place their hand over the nozzle to demonstrate putting a hand over your nose as you cough/sneeze. Pull the trigger again after predicting what will happen. Ask students if this is an effective way to stop the microbes in the snot spreading to others? The microbes stay on our hands and can spread to anything we touch. Explain that students should wash their hands immediately if they cough or sneeze into their hands.
  6. Ask someone to put a piece of kitchen towel over the nozzle to demonstrate holding a tissue over your nose as you cough/sneeze. Pull the trigger after predicting what will happen. The cough/sneeze is successfully caught in the tissue and won't infect anyone else if the tissue is thrown in the bin straight away. Ask the catcher to throw the tissue away.
  7. Ask the group to recite what they have learned, for example by repeating the phrase 'catch it, bin it, kill it'. Reinforce that catching a cough/sneeze in a tissue is the best way to prevent the spread of microbes to others.
- Students will notice that the spray travels furthest when it isn't covered.**

## Extension Activities

### Fact Sheet

SH1 contains fun facts about sneezes. You can read and discuss this sheet with students at the end of the snot runway activity, or provide it as a home reading activity for students.

### Super Slimy Snot Activity

Provide each student with the SH2 guide for students to make their own gooey snot. The activity demonstrates how snot sticks to germs and prevents them from entering our bodies.

### Super Sneezes Wordsearch

Provide each student with a copy of SW1 and ask them to find hidden key respiratory hygiene words, this can be completed in class or as a homework activity.

### Fill in the Blank Worksheet

Provide each student with SW2. Ask students to name the image to complete the sentence. Students can re-write the completed sentence or read it out loud.

## Learning Consolidation

At the end of the lesson, ask the class to create some simple rules or messages to reduce the spread of coughs, colds and flu in their school, for example:

- Coughs and sneezes spread diseases.
- Catch it, bin it, kill it.
- Cover my coughs and sneezes with a tissue or cough/sneeze into the crook of my elbow or sleeve (not my hand).
- Wash my hands after a cough or a sneeze or use hand sanitiser.







# Super sneezes

## Fact sheet

### Why do we sneeze?

Sneezing is a way in which our body tries to get rid of harmful microbes. Germs and dust get stuck in our nose hair and so we sneeze to blow them away.

### What is in a sneeze?

Sneezes contain snot and harmful microbes. That is why it's important to cover our sneezes with a tissue or our sleeve (but never our hand), so we don't pass the harmful microbes onto someone else.



Surprise your friends and family with these fun facts!

**DID YOU  
KNOW?**

- Sneezes can travel at a speed of 100 miles per hour!
- Sneezes can spread microbes 2-3 meters.
- The longest sneezing spree was 978 days, a record set by Donna Griffiths of Worcestershire, England.
- It is impossible to sneeze without closing your eyes.
- It is illegal to burp or sneeze in a church in Nebraska.





# Super slimy snot

## Activity

### Make your own snot!

Sticky, slimy snot in our noses traps microbes. This helps to stop harmful microbes getting into our bodies and making us poorly. Ask an adult to help you make your own snot using the recipe below.

### To make your own snot, you will need:

#### INGREDIENTS

- PVA Glue
- Laundry starch and warm water
- Green food colouring
- Water
- 2 disposable cups, labelled A and B
- A plastic spoon or stirrer
- A tablespoon
- Rubber gloves

### Method

1. Put the gloves on. Fill cup A with water, and ask an adult to add a spoonful of laundry starch to the cup. Stir to mix the powder and water.
2. In cup B, add 2.5cm of PVA glue to the bottom of the cup, and mix with about three tablespoons of water. Stir to mix.
3. Add a few drops of green colouring to cup B and stir to mix.
4. Finally, add a tablespoon of the starch solution (from cup A) to cup B, and watch the green slimy snot form! After about 30 seconds you can play with it!

### You can play with the snot, but do not eat it!

Wash your hands when you have finished playing with the snot. It will last a few days if you keep it wrapped up in cling film.





# Super Sneezes Wordsearch

Can you find all the sneezy words in the wordsearch below?

Remember that words can be horizontal (across), vertical (down) or diagonal (top left to bottom right)

G	E	R	M	S	N	Y	Y	K	O
M	C	O	L	D	J	Z	W	T	S
B	N	O	H	C	D	E	I	W	P
A	P	I	G	S	U	B	U	G	S
C	B	Z	J	C	N	C	O	K	S
T	F	L	U	P	M	O	J	A	N
E	B	V	K	A	S	D	T	T	E
R	F	C	O	U	G	H	S	B	E
I	I	W	F	R	S	V	H	B	Z
A	V	I	R	U	S	B	C	D	E

**SNOT**

**BUGS**

**VIRUS**

**COUGH**

**COLD**

**SNEEZE**

**FLU**

**BACTERIA**

**GERMS**





Into a



or



Throw the paper towel in the



Turn the



to run the



Put



on your



Rub your



together



Rinse your



with



Turn off the







# Prevention of Infection: Oral Hygiene

Students learn how plaque forms and why and how sugary food and drink can damage your teeth.

## Curriculum Links

### Science

Working scientifically, Living things and their habitats,

### PSHE/RSHE

Health and prevention

### English

Reading and comprehension, Writing

## Key Words

Bacteria, Plaque, Cavity, Sugar, Acid, Tooth brushing, Decay.

## @ Weblink

[e-bug.eu/eng/KS1/lesson/Oral-Hygiene](http://e-bug.eu/eng/KS1/lesson/Oral-Hygiene)

## Learning Outcomes

All students will:

- Understand what dental plaque is and how it forms.
- Understand the consequences of tooth decay.
- Understand that limiting sugary foods and drinks can reduce tooth decay.
- Understand the importance of eating healthier snacks.



## Resources Required

### Activity: Eggshell Experiment

#### *Per group*

- Egg shells – cracked and then cleaned out
- Clear cups
- High sugar cola
- Semi-skimmed milk or water
- High sugar juice drink
- Labels for cups

### Extension Activity: Tooth Brushing Chart

#### *Per student*

- SW1 e-Bug Healthy Teeth Progress Chart

### Extension Activity: Healthy Food Swaps

#### *Per class*

- TS1 Oral Hygiene True/False Quiz

#### *Per student*

- SH1 Healthy Food Choice Fact Sheet
- SH2 Oral Hygiene True or False cards
- SW2 Healthy Food Choice

## Advance preparation

1. Set out 3 cups per 3-4 students and label these as 1 to 3.
2. Divide up the eggshells so that each cup has one eggshell half.

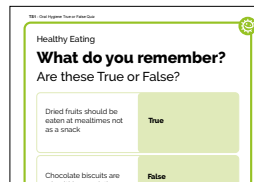
## Health and Safety

Ensure students do not drink the cola, especially those who may have diabetes. Students with egg or milk allergies or intolerances must not directly handle these components.

See the e-Bug website for alternative activities.

For safe microbiological practices in the classroom consult CLEAPPS [www.cleapps.org.uk](http://www.cleapps.org.uk)

## Supporting materials



Healthy Eating  
What do you remember?  
Are these True or False?

Dried fruits should be eaten at mealtimes not as a snack.	True
Chocolate biscuits are a healthier snack than...	False

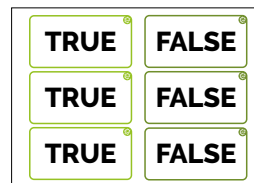
### TS1 Oral Hygiene True/False Quiz



Healthy Food Choice  
Fact Sheet

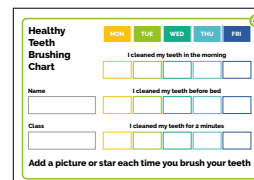
Breakfast			
			
			
Drink			

### SH1 Healthy Food Choice Fact Sheet



TRUE	FALSE
TRUE	FALSE
TRUE	FALSE

### SH2 Oral Hygiene True or False Cards



Healthy Teeth  
Brushing  
Chart


I cleaned my teeth in the morning

Name \_\_\_\_\_ I cleaned my teeth before bed

Class \_\_\_\_\_ I cleaned my teeth for a minutes

Add a picture or star each time you brush your teeth

### SW1 e-Bug Healthy Teeth Progress Chart



What healthy breakfast, drink and snack would you eat to help keep your teeth healthy?

Write your choice

Breakfast	Drink	Snack

### SW2 Healthy Food Choice

# Lesson Plan



## Introduction

1. Ask the students to think about their teeth; ask them what are they like (they are hard and white and shiny). Ask the students why they think their teeth are like that (so that they are strong and can chew and bite food).
2. Pass around the eggshells, have the students (carefully) examine them. Ask them if they think they are like any parts of their body? The students should be able to identify that they are like their teeth. Tell the students that teeth are made of layers. The eggshell is similar to the hard layer on our teeth called the enamel.
3. Explain to the students that throughout the day, germs called bacteria grow on teeth to form a sticky substance called plaque and when we eat sugary foods and drinks the bacteria uses the sugar to attack our teeth (especially the hard outer enamel layer). This is why it is important to brush our teeth to get rid of the bacteria.

## Discussion

The next day, have the student check on their eggs. What changes can they see? Why do they think that has happened?

Tell the students that the sugar in the drinks has damaged the eggshells and made the shell discolour – remind the students that the eggshell is like the enamel on their teeth, and a lot of sugar can cause damage to their teeth.

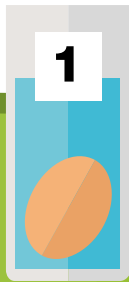
Ask the students what they think they should do to keep their teeth healthy? Answers should include:

- Have sugary food and drinks less often and in small amounts
- Brush your teeth twice a day (before school and before bed)
- Using a fluoride toothpaste
- Spit don't rinse
- Visit your dentist regularly.



# Activity: Egg Shell Experiment

1 Label each cup with a number from 1 to 3



2 Place each egg in a different cup



3 Pour one of the liquids in each cup (enough to cover the egg)

4 Wait at **LEAST** one day



1. Explain to the students you will be using the eggshells to show what sugar can do to our teeth.

2. Divide the class into groups of 3-4 and give them 3 cups labelled 1-3. Assist them placing one eggshell half into each cup and pouring the three drinks you've chosen into the cup.

1. Cola
2. Water (or milk)
3. Juice

3. To see the effects, you will need to wait one day. Now, ask the students: What will happen to the egg if you leave it in the drink for a long time? Which liquid will change the egg most? Which liquid will change the egg least? You can record their guesses for tomorrow.

After one day, students will notice a discoloured and partly dissolved eggshell from the cola, an unchanged eggshell from the water (or milk), and a slightly dissolved eggshell from the juice. This demonstrates that high sugar content foods and drinks can damage the enamel.

## Extension activity

### Tooth Brushing Chart

SW1 is a useful way to encourage routine tooth brushing. Provide one sheet per student. Ask students to mark or draw a picture every time they brush their teeth to keep track of how often they have brushed their teeth during one school week. This can be completed in the classroom or at home.

### Healthy food swaps

Begin by reminding students how the sugar in the cola effected the eggshell. Eating too much sugar is bad for you and can cause tooth decay. Around half the sugar we consume comes from unhealthy snacks and sugary drinks. That is why it is important to choose healthier snacks. Fruit and vegetables are a good snack choice; you can eat them on their own or with a healthy dip. Dried fruits have a high sugar content and they should be kept to mealtimes only.

Ask the class what their favourite fruit and vegetable snacks are.

Tell students that they can swap their unhealthier foods (e.g. sugary breakfast cereals) and drinks (e.g. sugary fizzy drinks, fruit juice and smoothies, full sugar squash) for lower sugar alternatives such as low sugar yoghurt with fruit, lower fat milks, plain waters, or no-added sugar/sugar free squash. We don't need to worry about the sugar in whole fruits and vegetable and plain milk and plain yoghurts because this isn't added sugar. Smoothies and fruit juices should be consumed a maximum of 150ml per day.

What other swaps can they think of?

Provide students with SH1 Healthy Food Choice Factsheet to help them complete SW2 and ask students to draw their favorite food swaps on SW2. Food items with the most green labels are considered the healthiest choices and the ideal swap.

### Oral Hygiene True or False Quiz

Hand out SH2 to groups of 3 or 4 students. Ask students to cut out the cards and hold them up to answer True or False quiz contained in TS1. Answers are provided on the sheet.

## Learning Consolidation

At the end of the lesson, ask the class the series of questions below as a fact checker.

- What is the sticky substance made up of bacteria that clump together on our teeth called?  
Answer: Plaque
- Complete the sentence; When we consume sugary foods and drinks, this leads to an attack on our teeth that can lead to....?  
Answer: Tooth decay
- How many times a day should you brush your teeth with toothpaste.  
Answer: At least twice
- After brushing, should you; a) spit out the toothpaste and rinse; b) spit out the toothpaste and don't rinse?  
Answer: you should spit out the toothpaste but don't rinse (this will allow the fluoride to stay on the teeth for longer).





## Healthy Eating

# What do you remember?

## Are these True or False?

Dried fruits should be eaten at mealtimes not as a snack

**True**

Chocolate biscuits are a healthier snack than plain yogurt and fruit

**False**

Biscuits contain a lot of added sugar.

Lower-fat milk is a healthier drink choice than a sports drink?

**True**

Sports drinks can contain lots of sugar. Water or lower-fat milk are better choices.

Eating too much sugar can cause tooth decay?





**True**









# Healthy Food Choice Fact Sheet





## Breakfast

 <p>High sugar cereal</p> <p>Fat Sugar Salt</p>	 <p>Wheat biscuit cereal</p> <p>Fat Sugar Salt</p>	 <p>Porridge</p> <p>Fat Sugar Salt</p>	 <p>Jam on toast</p> <p>Fat Sugar Salt</p>
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## Drink

 <p>Squash and water</p> <p>Fat Sugar Salt</p>	 <p>Chocolate milk</p> <p>Fat Sugar Salt</p>	 <p>Orange juice</p> <p>Fat Sugar Salt</p>	 <p>Full sugar cola</p> <p>Fat Sugar Salt</p>
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## Snack

 <p>Chocolate bar</p> <p>Fat Sugar Salt</p>	 <p>Malt loaf</p> <p>Fat Sugar Salt</p>	 <p>Low sugar yogurt</p> <p>Fat Sugar Salt</p>	 <p>Regular yogurt</p> <p>Fat Sugar Salt</p>
--	--	---	---





**FALSE**



**FALSE**



**FALSE**



**TRUE**



**TRUE**



**TRUE**





# Healthy Teeth Brushing Chart

MON

TUE

WED

THU

FRI

I cleaned my teeth in the morning

Name

I cleaned my teeth before bed

Class

I cleaned my teeth for 2 minutes

**Add a picture or star each time you brush your teeth**





# What healthy breakfast, drink and snack would you eat to help keep your teeth healthy?

Write your choice

Draw your choice

Breakfast

--	--

Drink

--	--

Snack

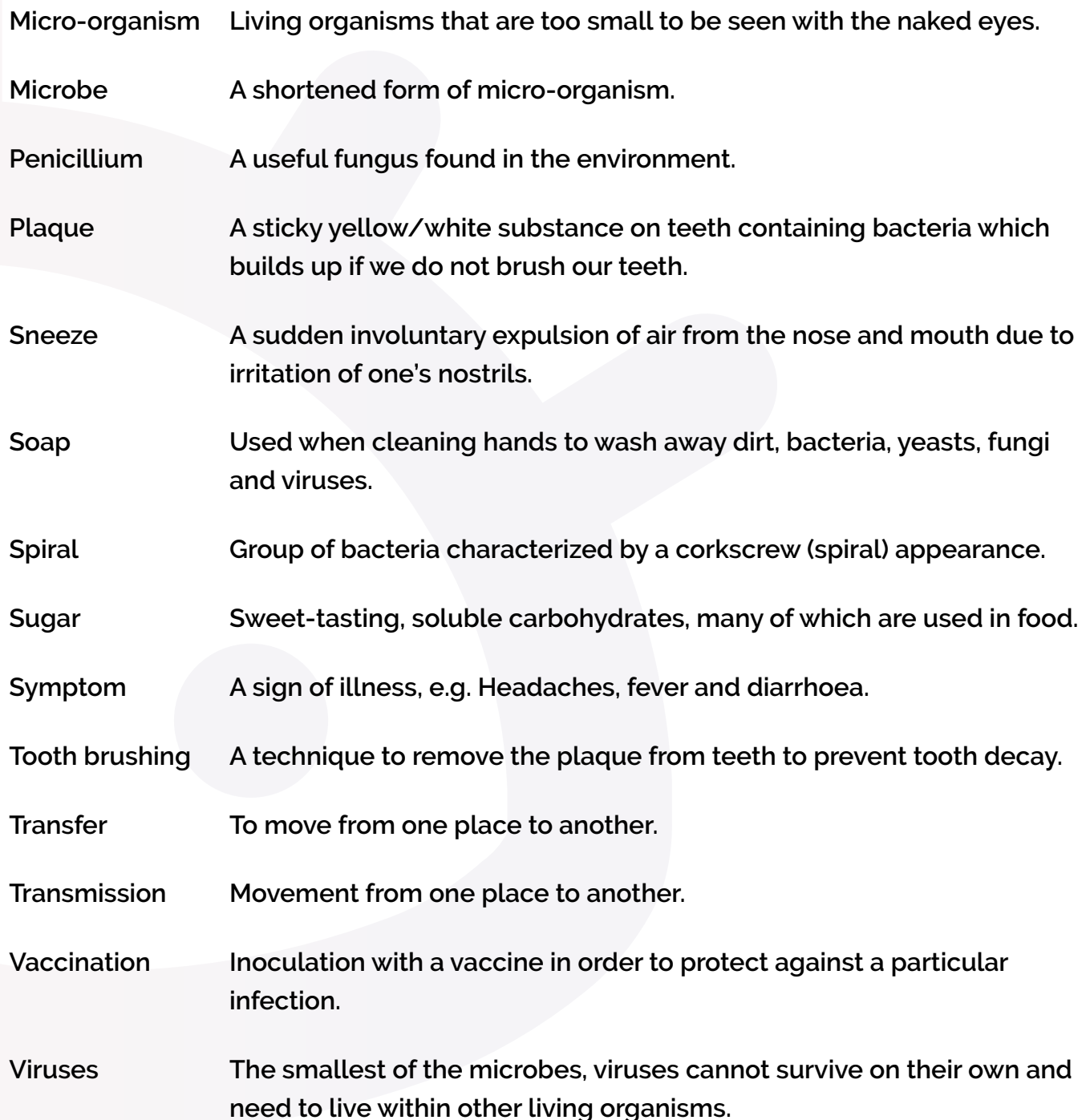
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# Glossary

Acid	Substance with a pH less than 7 produced by bacteria in the mouth that can dissolve the surface of teeth.
Bacilli	Rod-shaped bacterium.
Bacteria	Microscopic single celled microbe that can be beneficial or harmful to humans.
Cavity	Another word for dental decay.
Cocci	Round shaped bacterium.
Contagious	Able to be spread to others through direct or indirect contact.
Cough	A cough is a reflex action to clear your airways of mucus and irritants such as dust or smoke.
Decay	To break down slowly by natural processes.
Experiment	A test carried out to observe whether or not an idea or theory is true or false.
Fungi	The largest of the microbes. Unlike bacteria or viruses, fungi are multicellular.
Germ	Another word for harmful or pathogenic microbes.
Hand sanitiser	A liquid or gel, typically one containing alcohol, that is used to clean the hands and kill infection-causing micro-organisms.
Hand washing	The act of cleaning one's hands with soap and water to remove viruses/ bacteria/micro-organisms, dirt, grease, or other harmful and unwanted substances stuck to the hands.
Hygiene	Conditions and practices that serve to promote and preserve health and reduce spread of infection.
Infection	A disease caused by a microbe.
Infectious	Spread of a microbe.
Lactobacilli	A useful rod-shaped bacterium found in the gut.





Micro-organism	Living organisms that are too small to be seen with the naked eyes.
Microbe	A shortened form of micro-organism.
Penicillium	A useful fungus found in the environment.
Plaque	A sticky yellow/white substance on teeth containing bacteria which builds up if we do not brush our teeth.
Sneeze	A sudden involuntary expulsion of air from the nose and mouth due to irritation of one's nostrils.
Soap	Used when cleaning hands to wash away dirt, bacteria, yeasts, fungi and viruses.
Spiral	Group of bacteria characterized by a corkscrew (spiral) appearance.
Sugar	Sweet-tasting, soluble carbohydrates, many of which are used in food.
Symptom	A sign of illness, e.g. Headaches, fever and diarrhoea.
Tooth brushing	A technique to remove the plaque from teeth to prevent tooth decay.
Transfer	To move from one place to another.
Transmission	Movement from one place to another.
Vaccination	Inoculation with a vaccine in order to protect against a particular infection.
Viruses	The smallest of the microbes, viruses cannot survive on their own and need to live within other living organisms.

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**Educating children in the areas of microbiology, hygiene and appropriate antibiotic use will help prevent antibiotics being exhausted in the future.**

**Children will grow up knowing when antibiotics should and shouldn't be used and understand effective hand and respiratory hygiene.**

This resource pack has information, suggested lesson plans that can be adapted, and includes activities for you to use in your classroom to help you inspire and inform your pupils.

These resources cover topics in both the Early Years Framework and National Curriculum such as "Physical development" in Early Years and "Working scientifically" and "Living things and their habitats".

This resource can be shared with PSHE teachers for use with Core Theme 1 – Health and prevention, part of the PSHE Association programme of study supported by the Department for Education.