

# Horrid Hands

## Learning Objectives

- Microbes can spread through touch
- We pick up microbes from the things we touch and can spread these to other people
- Washing hands can help remove microbes
- Washing hands is one of the best ways to prevent the spread of microbes
- Washing hands with soap and water is better than washing hands with water alone

## Activity 1 : Materials

- 2 washing up bowls
- Water
- A box containing GloGerm gel and a UV light
- Kitchen roll
- Bin liners
- Hand soap



## Set Up

1. Shake the GloGerm gel bottle to mix the contents, or the demonstration may not work
2. Fill the washing up bowls with water
3. The water should be changed every 2-3 groups and should not get too murky.

Please see the virtual Science Show video for an example of how this stand can be run:

<http://bsac.org.uk/science-fair//stands/horriblehands/>

# Horrid Hands

## Instructions

This activity demonstrates what happens if we don't wash our hands and how germs can be spread. The concept is to pretend that the participants have just got their hands dirty i.e. by sneezing in them or preparing a meal, and then to observe how the germs will spread.

1. Explain to the students that microbes are everywhere and they get on to our hands from the things that we touch. We then pass these on to other people. Washing our hands is the best way to remove these microbes.
2. Explain when we should wash our hands – before and after preparing food, after using the toilet, after touching animals and after coughing or sneezing.
3. Ask the students to line up one behind the other like a queue. If there are more than 5 students, form 2 queues so that there are no more than 5 students per queue.
4. Squeeze a little GloGerm gel into the student at the front of the line's hands and ask them to rub in the 'pretend microbes'.
5. The person in the front should then turn around and shake hands with the person behind them, and so on, until they have all shaken hands with the person behind them in the queue.
6. Use the UV light to show the students how the germs got passed down the line – point out how dirty their hands are and how the germs spread because they didn't wash their hands. The person at the back of the queue should still have germs on their hands.
7. Ask participants to rinse their hands in the washing up bowls as they would usually and give kitchen roll to each person to dry their hands.
8. The UV light can be used again to see how many germs remain.
9. Demonstrate the proper way to wash hands with soap and ask them to follow your movements: do the six step technique – palm to palm, back of the hands, in between the fingers, back of the fingers, the thumbs, tips of the fingers (illustrated on the backing stand).

# Horrid Hands

## Activity 2 : Materials

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



## Set Up

1. 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.

## Instructions

This activity aims to show why washing with soap and water is better than using water alone. Demonstrators should help children with cocktail sticks to ensure safety. The bowls must be rinsed after each group for this to work.

1. Tell participants 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. Tell the students that this shows 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 then they can be rinsed away under running water.
6. Rinse the pepper water bowls, dry with kitchen towels and reset between groups.



# Horrid Hands



See how by washing your hands thoroughly, the bacteria is removed.



Bacteria on a hand after using the toilet and before washing hands.



Bacteria on a hand after handling raw meat.



Bacteria on a hand after touching an old dishcloth.



Bacteria on a hand after handling a raw chicken.



Notice how people often miss their thumbs when washing hands.

Images © Food and Drink Federation (foodlink - [www.foodlink.org.uk](http://www.foodlink.org.uk)).

Microbes spread easily through coughs and sneezes, food and water, animals and touch. Every day thousands of microbes get onto our hands from the things we touch and we transfer these microbes onto other places or people.

Washing your hands is the best tactic to stop the spread of any harmful microbes and preventing people getting ill. Although washing hands in water alone, or in cold water eliminates visible dirt, soap is required to break up the oil on the surface of the hands that can trap microbes.



## When should you wash your hands?

- Before during and after preparing food especially raw meat
- After using the toilet.
- After exposure to animals or animal waste.
- After coughing, sneezing or blowing your nose.
- If you're ill or have been around ill people.

## Why wash your hands?

- To remove germs from your hands and environment.
- To reduce the occurrence of infections for yourself and others.
- To help prevent the spread of infection

## What's in a hand shake?

Most microbes on our hands are harmless or even good for our skin. Sometimes however, we can pick up potentially harmful microbes from the things we touch every day e.g. toilet handles, raw food, dishcloths and **other peoples hands** when we shake them! Look at the fingerprint images below and see how far the microbes on the first persons hand have spread.

## How should you wash your hands?

How we wash our hands is just as important as when we wash them, especially when it comes to eliminating harmful microbes. We don't need any special cleaners or cleaning equipment — just soap and water.



Palm to palm



The back of the hands



Inbetween the fingers



The back of the fingers



The thumbs



The tips of the fingers.

## Facts on hand hygiene

- In 1847, Dr Ignaz Semmelweis demonstrated that that hand washing could prevent infection.
- According to CDC, the single most important thing we can do to keep from getting sick and spreading illness to others is to clean our hands.
- Nearly 22 million school days are lost due to the common cold alone.
- Some viruses and bacteria can live from 20 minutes up to 2 hours or more on surfaces like cafeteria tables, doorknobs, and desks.
- Proper hand hygiene demonstrated by 'people in charge' has been shown to positively influence others' compliance by up to 70%.



Contact Primary Care Unit  
[cliodna.mculty@phe.gov.uk](mailto:cliodna.mculty@phe.gov.uk) / [vicki.young@phe.gov.uk](mailto:vicki.young@phe.gov.uk)  
 0300 422 5062 [www.e-bug.eu](http://www.e-bug.eu)

# Horrid 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 bad microbes that might make us ill. It is important that we wash our hands after using the toilet, before eating or cooking, after stroking animals or after coughing or sneezing.

## Did you know?

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

- ➡ Most microbes on our hands are under our finger nails!
- ➡ 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.
- ➡ Microbes can stay alive on our hands for up to three hours!



# Horrid Hands

## Why do we use soap to wash our hands?

To find this out, you will need:

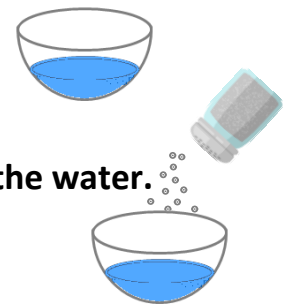
### Ingredients

- 1 Bowl (a cereal bowl will be fine)
- Some water
- A sprinkle of black pepper or other spice
- Some hand soap or washing up liquid
- A Towel
- A Pen
- A Notebook
- A Camera (optional)



### Method

1. Fill the bowl with **water**, but not right to the top.
2. **Sprinkle** some black pepper or spice onto the surface of the water. It should **float** on top.
3. **Dip** your finger into the centre of the water and **watch** what happens to the pepper. Take a **photo** to record what has happened.
4. **Dry** your hand, and then dip your finger into the **soap**.
5. Dip your soapy finger into the **water**. Watch what happens to the pepper. Take a **photo** to record what has happened.



Now answer this question:

What happened with and without the soap?





# **Horrid Hands**

## **Why do we use soap to wash our hands?**

**From your results, can you answer the question: “Why do we use soap to wash our hands?”**

### **Explanation**

The experiment with and without soap should have been different. When the soap was on your finger the pepper should have moved towards the edges of the bowl. This is because the soap removes the oils on your hands and the oil pushes the pepper towards the edge of the bowl.

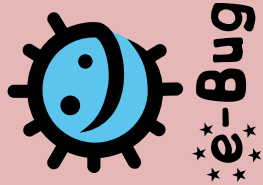
Microbes like to stick to the oils on your hands, which is why we wash our hands with soap. Without soap, the oils are not removed, and microbes find it easier to stick!

# Horrid Hands

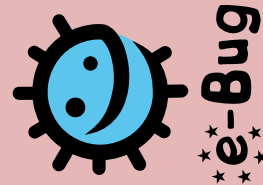
## Quiz

1. Gather together your friends or family
2. Someone will need to be the quizmaster and read the questions!
3. Teams/players must hold up one of the cards with their answer
4. The one with the most correct answers wins!

True



False





# Quiz 1



We should only wash our hands once a day



We should never use soap to wash our hands



All the microbes on our hands are good for us



Soap can remove more microbes than washing with water alone



We should wash our hands after sneezing into them

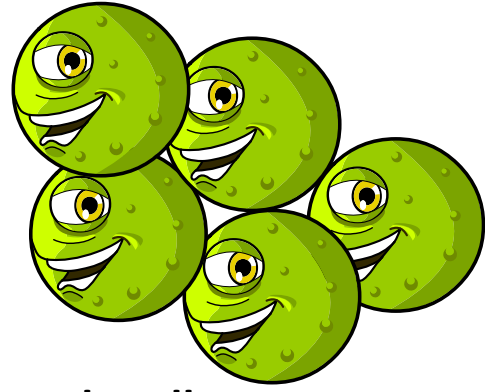


Microbes can spread from person to person when we touch things



For washing our hands, cold water is better than hot water

# Quiz 2



You can pick up microbes from door handles



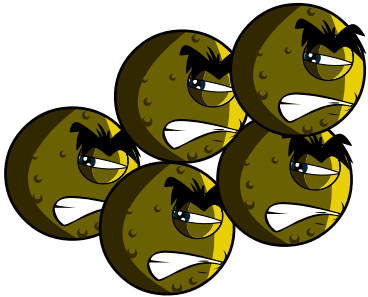
Washing our hands often can help stop us getting ill



There is no need to wash your hands before visiting friends or family in hospital



Microbes can hide in the oil of our skin to avoid being washed away



You should always wash between your fingers



All microbes on our hands are bad for us



There is no need to wash your hands often because microbes cannot live more than 5 minutes on many surfaces

# Horrid Hands

## Answers - Quiz 1

**1. We should only wash our hands once a day**

**FALSE**

We pick up microbes from the things that we touch, so we should wash our hands often.

**2. We should never use soap to wash our hands**

**FALSE**

Soap helps to remove bad microbes from our hands so we should always use soap to wash our hands.

**3. All the microbes on our hands are good for us**

**FALSE**

Microbes on our hands are both good and bad.

**4. Soap can remove more microbes than washing with water alone**

**TRUE**

Soap removes the oil on our hands, which washes away microbes. This removes more microbes than washing with water alone.

**5. We should wash our hands after sneezing into them**

**TRUE**

Sneezes contain bad microbes which can spread onto our hands when we sneeze.

**6. Microbes can spread from person to person when we touch things**

**TRUE**

Microbes are found on our hands and when we touch things, we can spread these microbes on to other people.

**7. For washing our hands, cold water is better than hot water**

**FALSE**

Hot water removes more microbes than cold water and so we should always wash our hands with hot water and soap.

## Horrid Hands Answers - Quiz 2

1. You can pick up microbes from door handles

**TRUE**

We pick up microbes from the things that we touch such as door handles, school desks or the floor.

2. Washing our hands often can help stop us getting ill

**TRUE**

Washing our hands is the best way to remove bad microbes from our hands that could make us ill.

3. There is no need to wash your hands before visiting friends or family in hospital

**FALSE**

We should wash our hands before visiting people in hospital so that we don't take bad microbes into the hospital that could make people ill.

4. Microbes can hide in the oil of our skin to avoid being washed away

**TRUE**

Microbes stick to the oil on our skin. This is why we should use soap to wash our hands, as it removes the oil and washes away the microbes.

5. You should always wash between your fingers

**TRUE**

Microbes are found between our fingers!

6. All microbes on our hands are bad for us

**FALSE**

Microbes on our hands are both good and bad.

7. There is no need to wash your hands often because microbes cannot live more than 5 minutes on many surfaces

**FALSE**

We should wash our hands often as microbes can live for up to 2 hours on some surfaces.

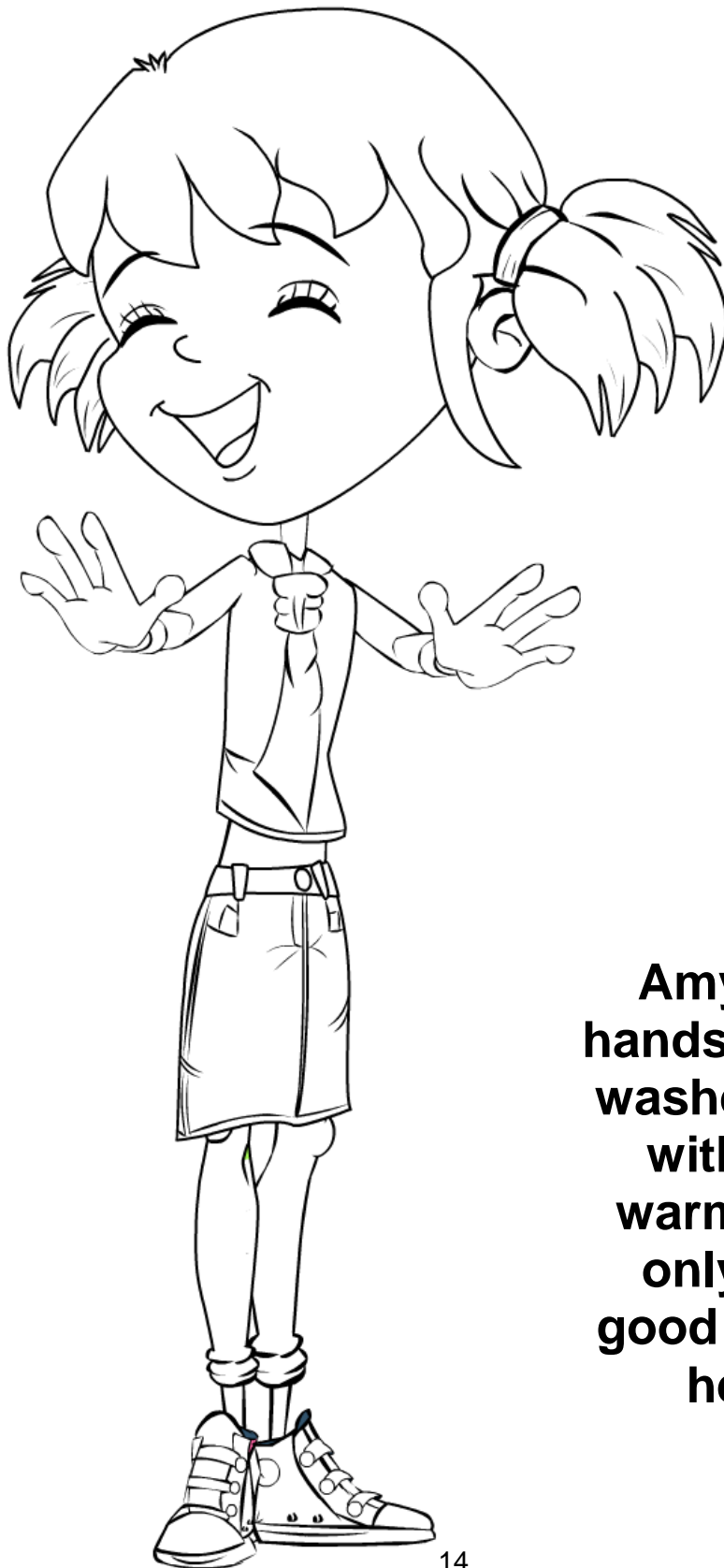
**Colour in Harry and make his  
hands look dirty!**



**Harry has dirty  
hands with lots of  
microbes because  
he has not washed  
his hands with  
warm water and  
soap**



**Colour in Amy to show she has  
clean hands!**



**Amy has clean  
hands because she  
washed her hands  
with soap and  
warm water. She  
only has a few  
good microbes on  
her hands.**