

# SQUEAKY CLEAN

**Research Project**  
For Teachers **p2&3**, for Students **p4**

## HEALTH AND SAFETY

Students should be encouraged to make their own risk assessment before they carry out any activity, including surveys. In all circumstances this must be checked by a competent person. Students using specialised equipment should be supervised at all times.

Students may want to set up unorthodox experiments and you may need to seek specialist advice.

Organisations such as CLEAPSS and the Royal Society of Chemistry are able to help. The MISAC (Microbiology in Schools Advisory Committee) can provide advice concerning microbiological investigations.

# SQUEAKY CLEAN:

Silver Research Project - For Teachers



## Soap solution

In the medieval world, pandemics were rife. Improved standards of hygiene have helped to bring these diseases under control. The widespread use of soap for washing hands, clothes and surfaces contributes to this daily battle. With the appearance of MRSA, C. diff and swine flu, the importance of effective hand washing is now at the forefront of Public Health messages. Hospitals encourage visitors to use alcohol hand gels and people buy them for their own use. Yet many people still believe that hand washing isn't important.

Are we using the best methods to prevent the spread of potential killers like MRSA, C. diff and swine flu?

## HAVE YOU EVER WONDERED?

...are disinfectants and antiseptics really necessary at home?

You might like to imagine yourself in a situation such as...

Your friend's Gran says that all you need to keep clean and healthy is a bar of soap and hot water. You can use them to wash your hands and to clean your clothes and your home. You can even use them to clean up wounds. You wonder why there are other cleaning products on the market, so you decide to **research**

**information** to:

- find out why hand washing is an important part of the daily routine
- evaluate the effectiveness of using other cleaning methods for infection control
- decide if disinfectants and antiseptics have a place in the home.

## POSSIBLE EQUIPMENT, MATERIALS AND RESOURCES

Though primarily a 'theoretical' research project, 1-2 hours could usefully be spent in the laboratory – to illustrate, and explain or clarify, aspects already investigated theoretically.

Students may require normal laboratory equipment for simulation of the presence of bacteria on students' hands (e.g. powder or gel such as *Glo Germ*, *Germ Juice* or *GlitterBug*, ultraviolet lamp).

## Prompts

The **Student Brief** gives some triggers to start students thinking. They should realise that each trigger implies several items to research and compare. Encourage students to identify these themselves. However, if necessary, prompts such as those below might be given, to point students in suitable directions.

- **How hand washing helps to prevent the spread of disease**
  - What causes disease?
  - How can diseases be spread by failing to wash your hands?
- **Whether soap is effective for cleaning hands**
  - Why is the use of soap for cleaning better than water alone?
- **What other cleaning can be done in the home to help prevent disease**
- **Whether some cleaning products are better than others**
  - How do cleaning products work?
  - Do different jobs need different types of cleaning agents?
- **Why MRSA (Methicillin-resistant Staphylococcus aureus) and C. diff (Clostridium difficile) are so difficult to control**
  - Why have they been in the news?
  - What cleaning methods are used to try to control them?
  - Should we be worried about them in the home?
- **The cleaning products you would recommend for every home, to help control disease**
  - Are several types of cleaning product needed?
  - Can soap be used for everything?  
Which products are most effective?

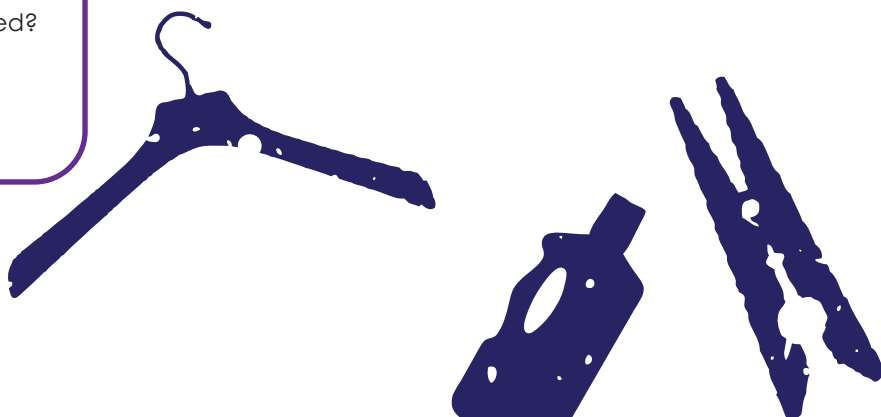
## Suggestions for supporting students

Though primarily based on secondary data, the Research project is likely to provide a more meaningful experience if the student includes some practical work. One possibility is for two students to undertake their projects – one Research, the other Practical – working independently, but coming together, to share mutually useful information and activities.

It is recommended that, wherever possible, Silver Award students should have a scientist or engineer as Mentor for their project. Please contact your CREST Local Coordinator to discuss mentoring.

Depending on the nature of the project, someone with knowledge and/or experience of cleaning and hygiene technologies could be ideal. The Mentor might be involved in...

- academic or industrial research in cleaning products
- professional cleaning
- health education
- the work of an environmental health officer
- Students should decide their focus, although this may alter in the light of experience as the project progresses.



## Internet search

Combine 'cleaning' with terms such as: products, health, hygiene, infection control, inexpensive, house, domestic; or try: soap, detergent or surfactant. Or try:

- **American Cleaning Institute**  
cleaninginstitute.org
- **Dr. Semmelweis Was Right: Washing Hands Prevents Infection**  
waterandhealth.org/newsletter/new/feb-1998/right.html
- **Handwashing, HPA (Health Protection Agency)**  
www.hpa.org.uk [enter handwashing or Semmelweis in the search box]
- **Hand washing experiment**  
www.bam.gov/teachers/activities/epi\_4\_hand\_wash.pdf
- **Get the facts about handwashing**  
uwyo.edu/SOAPERHERO

# SQUEAKY CLEAN!

## Silver Research Project - For Students



### Soap solution?

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messages. Hospitals encourage visitors to use alcohol hand gels and people buy them for their own use. Yet many people still believe that hand washing isn't important.

Are we using the best methods to prevent the spread of potential killers like MRSA, C. diff and swine flu?

### HAVE YOU EVER WONDERED?

...are disinfectants and antiseptics really necessary at home?

### You might like to imagine yourself in a situation such as...

Your friend's Gran says that all you need to keep clean and healthy is a bar of soap and hot water. You can use them to wash your hands and to clean your clothes and your home. You can even use them to clean up wounds.

You wonder why there are other cleaning products on the market, so you decide to

#### research information to:

- find out why hand washing is an important part of the daily routine
- evaluate the effectiveness of using other cleaning methods for infection control
- decide if disinfectants and antiseptics have a place in the home.

### Some things to think about...

- How hand washing helps to prevent the spread of disease
- Whether soap is effective for cleaning hands
- What other cleaning can be done in the home to help prevent disease
- Why MRSA (*Methicillin-resistant Staphylococcus aureus*) and C. diff (*Clostridium difficile*) are so difficult to control
- The cleaning products you would recommend for every home, to prevent disease

### Health and Safety

Should you decide to carry out any experiments:

- (a) find out if any of the substances, equipment or procedures are hazardous
- (b) assess the risks (think about what could go wrong and how serious it might be)
- (c) decide what you need to do to reduce any risks (such as wearing personal protective equipment, knowing how to deal with emergencies and so on)
- (d) make sure your teacher agrees with your plan and risk assessment.

**NOTE:** Your teacher will check your risk assessment against that of your school. If no risk assessment exists for the activity, your teacher may need to obtain special advice. This may take some time.