

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:

Bronze Research Project - For Teachers



Brand X or X-factor?

When the credit crunch began to bite in 2009, many people changed from expensive branded products, to the cheaper value for money lines. Is this a wise move? Are cheap cleaning products poor quality? Will the clothes of the nation become grey and shabby? Is it true that well known washing powders produce dazzling, good as new clothing?

HAVE YOU EVER WONDERED?

...how do cleaning products work?

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

Searching for snacks at home, you open a kitchen cupboard and a pile of bottles and packets fall out. When you look more closely, you see that they are all different kinds of cleaning products. You can't believe that so many types can be needed in one household. You think that the cupboard space would be better used for food. After all, money for treats could come from saving the cash spent on unnecessary cleaning

products! You decide to **research information** to:

- compare different ways to tackle a cleaning problem
- decide which cleaning products are really necessary in an average household
- recommend cleaning products, taking into account effectiveness and cost.

POSSIBLE EQUIPMENT, MATERIALS AND RESOURCES

Access to:

- Key Stage 3 and GCSE texts, or equivalent
- magazines, such as New Scientist – possibly archived in school or public library.

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.

- **What cleaning jobs there are around the home**
 - What things need cleaning?
 - How are they cleaned?
 - How does stain removal differ from killing 'germs'?
- **The kind of cleaning products that you want to focus on**
 - What different kinds of cleaning products are there?
 - Do products have different ingredients?
 - Do products work in different ways?
 - What is the difference between soap, detergent and surfactant?
- **Why do different things or types of stain need different methods of cleaning?**
- **How cleaning products work**
 - How do they 'lift stains' or 'kill germs'?
 - Why is water alone not an effective cleaning agent?
- **Whether some cleaning products are better than others**
 - What would make a cleaning product better than another one?
 - How would you know?
 - What tests could you carry out?
 - Is cost an important factor?
 - Is environmental impact an important factor?
 - How important are the raw ingredients in terms of performance, cost and environmental impact?
- **Are advertising claims for cleaning products justifiable?**

Suggestions for supporting students

Students must research and select information for themselves. However, they may need some direction from you to identify suitable sources of relevant information at an appropriate level.

Although Bronze Award students are not expected to have an official Mentor for their project, access to expert advice makes students feel their work is important. Also, if the topic is not in your area of expertise, you may find a mentor valuable. Your CREST Local Coordinator may be able to suggest suitable contacts.

Depending upon the focus of the project, someone with knowledge and/or experience of one or more of the following could be ideal:

- professional cleaning
- the work of an environmental health officer
- use of aseptic technique and/or bioassay
- enzyme technology applied to cleaning agents
- school cleaning problems

Discuss with students how they will manage their time (after school clubs, working during lunch hours, homework). Agree a completion date with them.

- Students should decide their focus and set manageable objectives, although these may alter in the light of experience as the project progresses.

Internet search

Combine 'cleaning' with terms such as: products, health, environmentally friendly, cheap, safe, hygiene, infection control, inexpensive, house, household, domestic; or try: soap, detergent or surfactant, or try:

- **How clean is your house? Channel 4**
channel4.com/4homes/on-tv/how-clean-is-your-house
- **Green-cleaning/natural-cleaning, Which advice**
which.co.uk/advice/green-cleaning/natural-cleaning-products/index.jsp
- **Detergents, soaps and surface tension, RSC (Royal Society of Chemistry)**
practicalchemistry.org/experiments/detergents-soaps-and-surface-tension,301,EX.html
- **What is soap made of?**
antoine.frostburg.edu/chem/senese/101/consumer/faq/making-soap.shtml



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poor quality? Will the clothes of the nation become grey and shabby? Is it true that well known washing powders produce dazzling, good as new clothing?

HAVE YOU EVER WONDERED?

... if cheap cleaning products work as well as more expensive ones?



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

Searching for snacks at home, you open a kitchen cupboard and a pile of bottles and packets fall out. When you look more closely, you see that they are all different kinds of cleaning products.

You can't believe that so many types can be needed in one household. You think that the cupboard space would be better used for food.

After all, money for treats could come from saving

the cash spent on unnecessary cleaning products! You decide to **research information** to:

- compare different ways to tackle a cleaning problem
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Some things to think about...

- The cleaning jobs there are around the home
- The different kinds of cleaning products available
- How cleaning products work
- The kind of cleaning problem that you want to focus on
- How you can test the effectiveness of cleaning products
- Do expensive brands work better than cheaper ones?

Health and Safety

Before you carry out any experiment:

- (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.

- (e) if special tools or machines are needed, arrange to use them in a properly supervised D&T workshop.