



TEACHER GUIDE

BRONZE AWARD



# PROJECT IDEAS WORLDWIDE WASHING

Inspired by the Global Grand Challenges presented by infectious diseases, three project ideas have been developed:

**Research:** DIRT DETECTIVES

**Practical:** SOAP OR NOPE

**Communication:** CLEAN COMMUNICATIONS

## YOUTH GRAND CHALLENGES

The Youth Grand Challenges is a new STEM competition that aims to inspire young people, aged 11-to-19, to see how science and technology can be deployed to tackle global health issues. The competition calls on students to come up with innovative solutions that have the potential to change the world, and will reward the best projects from young people created in response. The theme for 2016/17 is infectious diseases.

To participate in the Youth Grand Challenges competition, students must undertake a CREST project on a topic of their choice that relates to the overarching theme of infectious diseases – such as mosquitos, sanitation, or vaccines, and that is in an eligible topic area aligned with a current theme of research supported by the Global Grand Challenges  
<http://gcgh.grandchallenges.org/>

To enter your students for the Youth Grand Challenges competition, go to [www.youthgrandchallenges.org](http://www.youthgrandchallenges.org)

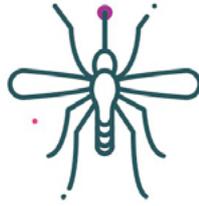
## SUPPORTING YOUR STUDENTS

To support educators and young people in the Youth Grand Challenges competition the British Science Association has released a suite of new CREST resources on the theme of infectious diseases. These resources have been produced by Practical Action and 4Science for the Youth Grand Challenges, in partnership with the CREST Awards scheme.

For each project, there is a Student Brief, providing a project idea and questions to get your students started, and a Teacher Guide, with some useful links and tips for prompting your students in their projects.

If you would like your students to achieve a CREST Award for their project, or for more information on how to support your students in their CREST Award project please go to [www.crestawards.org](http://www.crestawards.org).

Alternatively, if you do not wish to register for the full CREST Award, you can still use these resources on their own.



## DIRT DETECTIVES

### Research project

#### How do bacteria spread and infect many people

- What causes disease?
- Are disease, illness and infection all the same thing?

#### What happens when diseases get beyond our control

- Find out what an epidemic and a pandemic are?
- What types of disease can become an epidemic?

#### What can we do to stop them?

- Find out about treatments for specific epidemics.
- Is it always about medicine or are there other measures that help?

#### What examples are there from history and from recent times?

- Think about the last 10 years and look at news reports
- Find out more from history sources about both modern history and ancient times

#### Are people in other parts of the world at more risk than us?

- Consider different groups of people.
- Look for patterns and trends
- Is it about where people live; their living conditions or their wealth?

#### Why won't better hand washing not help with diseases like malaria?

- How is Malaria spread?
- What organisms are involved?

#### What else is being done to control malaria?

- What conditions encourage Malaria
- What can you do to protect yourself?
- What other changes might help reduce or eradicate Malaria?



## SOAP OR NOPE?

### Practical project

#### What water quality might some people in the world have, it is not all as good as your water?

- How pure is your tap water?
- People in developing countries need to use natural water sources like ponds, river or lakes, what else might be in the water?
- Will quality make a difference to the effectiveness of hand washing?

#### What will you look for to see if the washing has made a difference?

- Bacteria cannot be seen so how can you tell if they are there or not?
- Think about experiments to grow bacteria.

#### What are the different products you could test?

- What different hand washing products are there?
- Are there some that claim to kill bacteria?
- Are any described as sanitizers?

#### Is soap as effective as more expensive products?

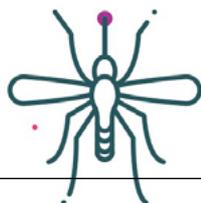
- How will you judge its effectiveness
- What will you compare it with?
- How might you make this comparison fair?

#### How will you compare the differences these products make?

- Will your chosen method work for all the products?
- Do you need to consider the costs of the products?
- Do some of them have other benefits or are they more convenient?

#### What sorts of diseases might widespread hand washing prevent?

- You will need to think about what causes disease.
- What sorts of disease are transmitted by contact?
- What sorts of diseases might lack of sanitation/hand washing spread?



## CLEAN COMMUNICATIONS

### Communication project

**A variety of techniques makes the key messages clear, simple to remember and accessible**

- Short sentences with clear themes work well
- Pictures can say as much as words and are more memorable

**Sometimes songs, poems plays or cartoons can work better than written materials**

- Making messages relevant to people's lives is important
- Something catchy will be repeated far more often and remembered
- Popular culture is a useful tool

**Think big and think small, you want reach as many people as possible**

- Not everyone responds to the same things
- Think about different age groups and interests

**Fun things are easy to remember even if the messages are serious**

- Something that makes us smile will stick in your mind
- People pass humorous ideas on to each other and share them

**You could try to find out about literacy levels in different parts of the world to judge how to make your materials accessible to everyone.**

- There will be a wide variety of literacy skill, some will be very well developed others less so
- Each audience will need materials of the correct level if they are to engage



### Useful Links

The following links are recommended in the pupil notes:

[www.unicef.org/wash/index\\_wes\\_related.html](http://www.unicef.org/wash/index_wes_related.html)

Information about common water and sanitation-related diseases

[www.un.org/sustainabledevelopment/health/](http://www.un.org/sustainabledevelopment/health/)  
Information on Global Goal 3 'Health and Well-being'

[www.nhs.uk/conditions/vaccinations/pages/the-history-of-vaccination.aspx](http://www.nhs.uk/conditions/vaccinations/pages/the-history-of-vaccination.aspx)

The history of vaccines

### Health and safety

Please do encourage students to take out their own risk assessments if they are carrying out a practical project or a survey, then check them yourself. CLEAPSS will provide any advice should you need it.

[www.cleapss.org.uk](http://www.cleapss.org.uk)

## GENERAL GUIDANCE

### Project 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.

### Support and Guidance

CREST gives students the chance to participate in hands-on science through investigations and enquiry-based learning. Students must decide their own focus; however, you may need to give additional support to students.

Your role is to:

- Act as a sounding board for students' ideas and nurture the students' work
- Help students see mistakes and setbacks as an opportunity for positive learning and lateral thinking (leading to creativity)
- Encourage your students in reflecting on their own performance and learning
- Where relevant, support students to find mentors from academia/industry
- Where relevant, ensure technician support is available to students
- Provide access to the Internet, library books and magazines (such as New Scientist)
- Provide direction to identify suitable sources of relevant information at an appropriate level. (NB. Students must research and select information for themselves.)

### Prompts

The student briefs give 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.

If students struggle to identify these the teacher guide provides extra prompts to help you guide them.

## CREST AWARDS

### Bronze

By working towards a CREST Bronze Award, students experience the project process; improving their enquiry, problem solving and communication skills. They have the opportunity to develop the project using their own ideas, taking decisions about how to progress with on-going support from their teacher.

The most important thing is that there is an element of investigation and exploration, and that the project sets out to answer a question or solve a problem.

To use their project to achieve a CREST Bronze Award your students will need to:

- Develop a project using their own ideas, taking decisions about how to progress through it
- Complete a minimum of 10 hours of project work
- Write about their findings and evaluate their project in their profile form or workbook

For full details about the CREST Bronze Award visit [www.crestawards.org/run-crest-awards/crest-bronze/](http://www.crestawards.org/run-crest-awards/crest-bronze/)