DITCH THE DIRT

Pupil activity sheets

CREST AWARDS

THE GLOBAL GOALS For Sustainable Development

practicalaction.org/schools/ditch-the-dirt

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The Sustainable Development Goals

No poverty	End poverty in all its forms everywhere.
Zero Hunger	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
Good Health & Well-being for People	Ensure healthy lives and promote well-being for all at all ages.
Quality Education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
Gender Equality	Achieve gender equality and empower all women and girls.
Clean Water & Sanitation	Ensure availability and sustainable management of water and sanitation for all.
Affordable & Clean Energy	Ensure access to affordable, reliable, sustainable modern energy for all.
Decent Work & Economic Growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
Industry, Innovation & Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
Reducing Inequalities	Reduce income inequality within and among countries.
Sustainable Cities & Communities	Make cities and human settlements inclusive, safe, resilient, and sustainable.
Responsible Consumption & Production	Ensure sustainable consumption and production patterns.
Climate Action	Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.
Life Below Water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
Life on Land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss.
Peace, Justice & Strong Institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
Partnerships for the Goals	Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Photographs from Turkana

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Investigating Water Quality

Name:

Class:

Scientists play a big role in investigating and analysing water quality. This includes water from rivers, water holes and at water treatment works.

Your science investigation is to analyse the odour and appearance of four different water samples.

Use the Water grading strips to help you score on the quality of its appearance, where 0 = Clear and 4 = Very dirty.

Water Sample	**Odour** What does the water smell of?	**Appearance – your description** What does the water look like?	**Appearance – your score** What score do you give it on the Water grading scale?
1			
2			
3			
4			

Water grading strips

Clear 0	Some cloudiness 1	Cloudy 2	Dirty 3	Very dirty 4
Clear 0	Some cloudiness 1	Cloudy 2	Dirty 3	Very dirty 4
Clear 0	Some cloudiness 1	Cloudy 2	Dirty 3	Very dirty 4
Clear 0	Some cloudiness 1	Cloudy 2	Dirty 3	Very dirty 4

Investigating sieving

Name:

Class:

Sieves are often used to separate solid materials from a liquid.

Imagine you are a group of scientists who have been given a sample of dirty water. Investigate and record your findings about the water sample before and after it has been sieved. Run the experiment with two sieves with different sizes of mesh.

Recording your results

Properties	**Description of the smell (odour)**	**Description of the apperance**	**Weight of solids in sieve (g)**
Water before sieving			
After sieve 1			
After sieve 2			
After sieve 1 and 2 together			

1. What solid materials have been separated out from the water sample through sieving?

2. Which type of sieve/s would you recommend to Kenyan scientists to include as part of a water cleaning system?

Ditch the dirt challenge

Name:

Class:

Imagine you are a group of scientists who have been given a sample of dirty water. Your challenge is to design and make a water filter that removes as much 'dirt' from the water as possible.

Before making your final filter for the challenge, make and test two different water filters.
You could try changing:

- the materials you use to make the layers
- the order of the layers
- the depth of the layers

Record the information about the samples before and after the water has been filtered for 5 minutes.

Filter investigation

Water properties	Describe the smell (odour) of the water	Describe how the water looks	Grade the quality of the water (0-4)	Amount of water collected (ml) in 5 minutes
Water before filtering				
Water filter 1				
Water filter 2				

Ditch the dirt challenge

Name:

Class:

Draw your final idea for your group's water filter. Label the materials and quantities you recommend to use in the filter.

Final test results

Water properties	Describe the smell (odour) of the water	Describe how the water looks	Grade the quality of the water (0-4)	Amount of water collected (ml) in 5 minutes

Based on your results, what recommendations would you make to Kenyan scientists to include in their water filters for use by people collecting water from ground water holes?

Costing our water filter

Name:

Class:

The target for Global Goal 6 on Clean water and sanitation is to ensure everyone has access to safe and **affordable water**.

Why is the cost of a water filter for the community in Turkana important to consider?

The currency in Kenya is the Kenyan shilling: £1.00 = 140 Kenyan shillings (approximately).

Material	**Cost per unit (Kenyan shillings)**	**Quantity used**	**Total cost**
2 litre plastic bottle or plastic tub	20		
Gravel	100 per cup		
Coarse sand	100 per cup		
Fine sand	120 per cup		
Marbles	200 per cup		
Cotton wool	5 per ball		
Paper towel	5 per towel		
Cloth	20 per 10 cm^2		
Elastic band	5 per band		
Card	10 per sheet		
Junk modelling material	5 per item		
		Overall total	

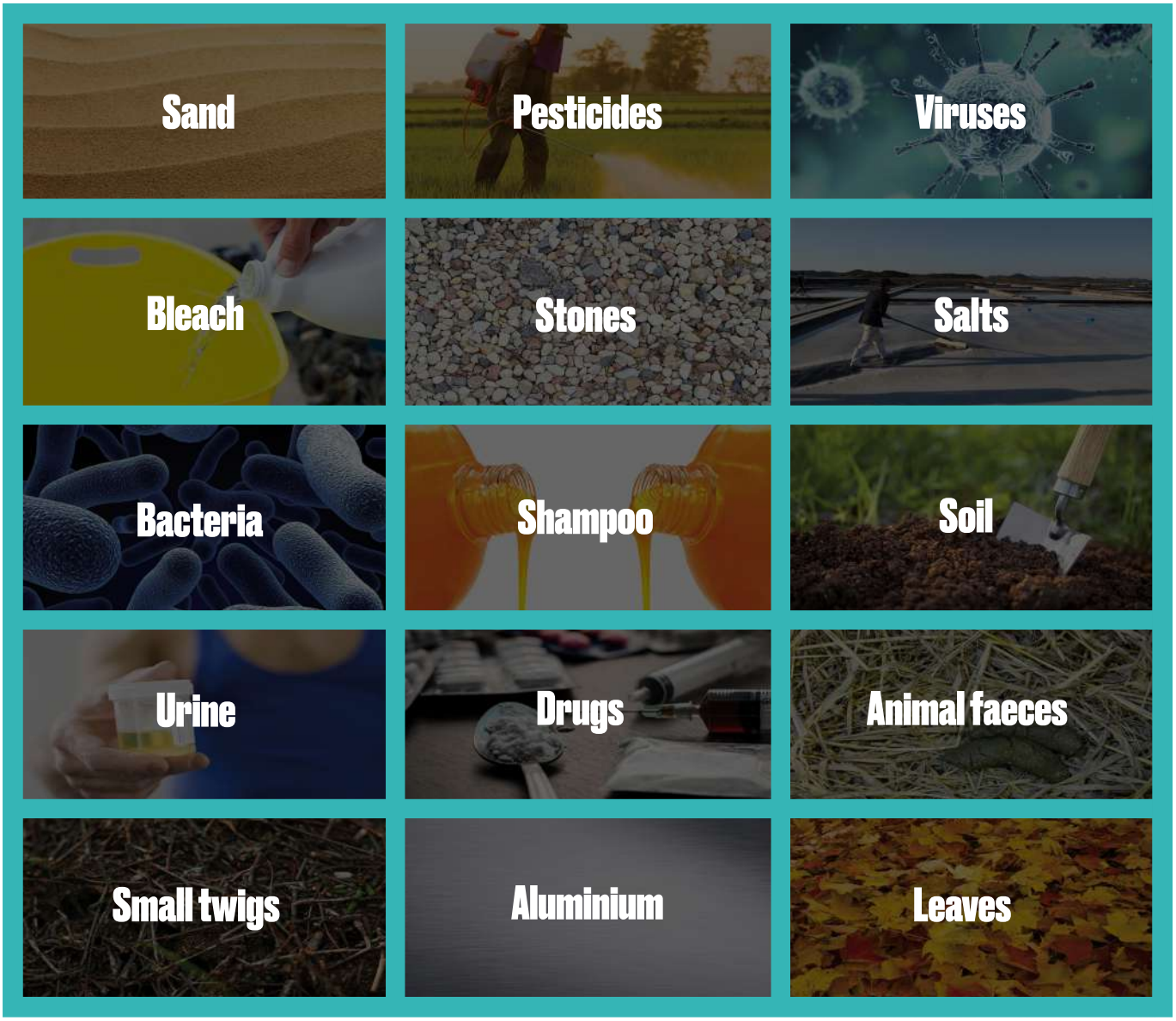
Safe to drink

Name:

Class:

Look at the things that are often found in dirty water in the table below.

Place a tick in the boxes that contain the 'dirt' that your water filter is likely to have filtered out.



Do these results mean your filtered water is safe to drink? Yes / No

What ideas do you have for ways of removing the contaminants that your filter has not removed to make the water safe to drink?

Research: safe to drink

Name:

Class:

Step 1 - Find out the different types of contaminants that can be found in 'dirty' water.

Step 2 - Research the different ways in which those contaminants can be treated to make the water safe to drink.

Record your findings. You can include pictures as well as notes.

Team Feedback

Name:

Imagine you are a water scientist working for a company that is keen to invest in ideas that help people in Turkana have access to clean water.

Listen to the presentations from each group. Think about how well they did in terms of the criteria in the table below. Make notes and give them a mark out of 5 for each area, where 5 is the best.

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Team name	Team work Did they work well as a team?	Research How well did they carry out their research?	Developing and finalising ideas Did they develop some good, innovative ideas, and improve on them?	Model How good is the final model?	Presentation How well did the team communicate their work?	Final score