

Photographs from Turkana



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Investigating Water Quality

Name

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 strip 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
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Clear 0	Some Cloudiness 1	Cloudy 2	Dirty 3	Very Dirty 4
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Clear 0	Some Cloudiness 1	Cloudy 2	Dirty 3	Very Dirty 4
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Clear 0	Some Cloudiness 1	Cloudy 2	Dirty 3	Very Dirty 4
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Ditch the Dirt challenge

Name

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 water samples before and after it has been filtered for 5 minutes.

Filter investigation

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

Our Ditch the Dirt Water Filter

Name

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 property	Smell (odour)	Description of the water quality	Grade of the water quality (0-4)	Amount of water (ml) collected 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?

How much did our filter cost?

Name

The target for Global Goal 6 on 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 pleastic tub	20		
Gravel	100 per cup		
Coarse sand	100 per cup		
Find sand	120 per cup		
Marbles	200 per cup		
Cotton wool	5 per ball		
Paper towel	5 per towel		
Cloth	20 per 10cm ²		
Elastic band	5 per band		
Card	10 per sheet		
Junk modelling material	5 per item		
Overall Total			

Investigating sieving

Name

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.

Record your results

Properties	Description of the odour (smell)	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

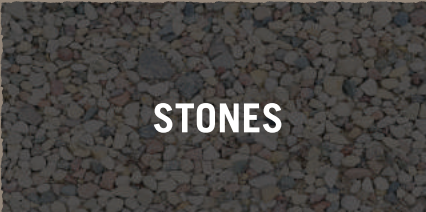
Which type of sieve/s would you recommend to Kenyan scientists to include as part of water cleaning system?

Safe to Drink

Name

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.

 SAND	 PESTICIDES	 VIRUSES
 BLEACH	 STONES	 SALTS
 BACTERIA	 SHAMPOO	 SOIL
 URINE	 DRUGS	 ANIMAL FAECES
 SMALL TWIGS	 ALUMINIUM	 LEAVES

Does that mean your filtered water is safe to drink? Yes / No

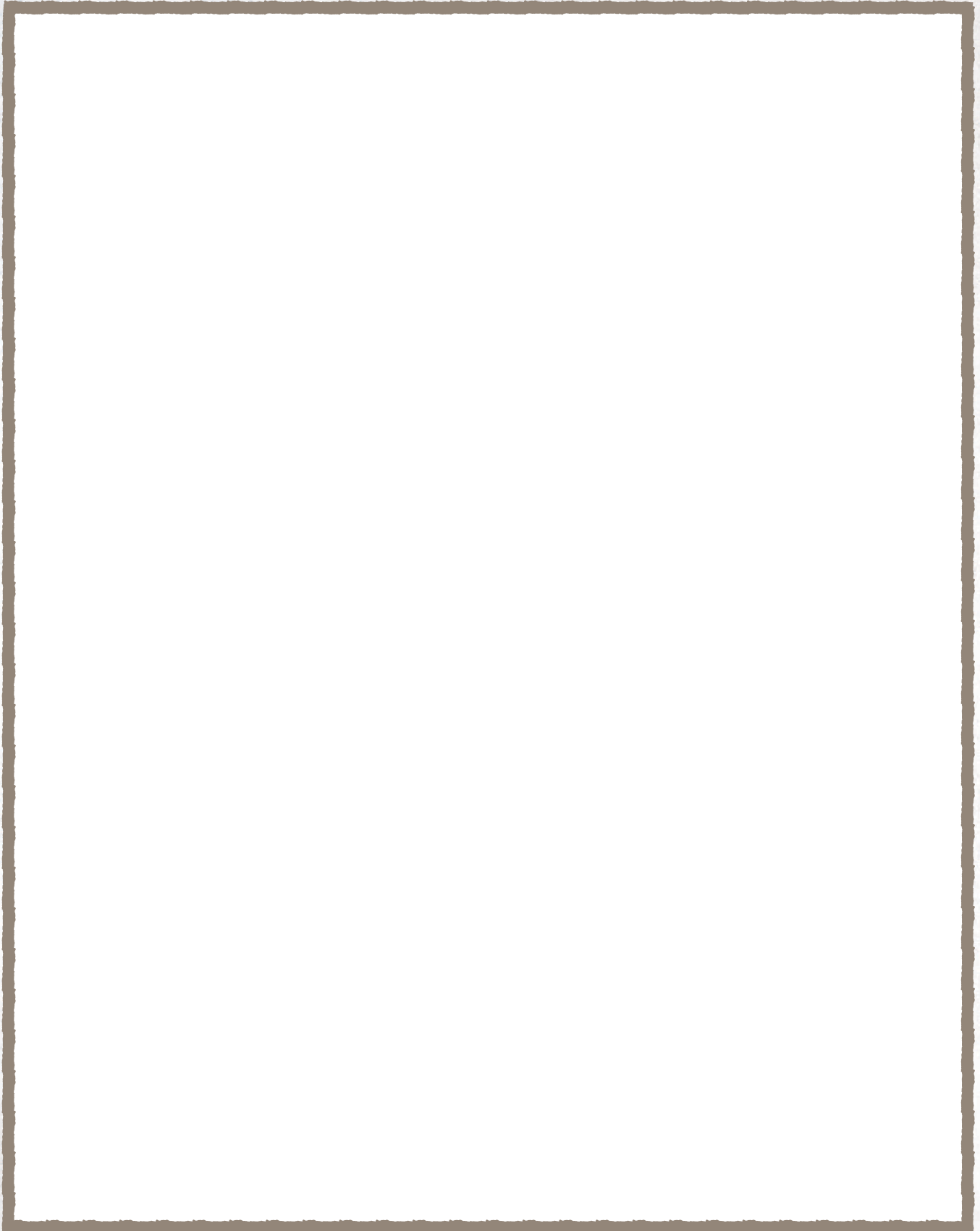
What ideas do you have for ways of removing the contaminants that your filter has not removed to make the water safe to drink?

Research: Safe to drink

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.



Evaluation

Imagine you are a water scientist working for a company that is keen to invest in ideas that help people have access to clean water. Listen carefully to the different groups' presentations and think about how you will score them on the criteria below.

Give them a mark out of 5, where 5 is the best and 0 is the worst.

- **Teamwork** Did they work well? Did all the team contribute towards the challenge?
- **Experiments** Did they test two filters before their final model?
- **Ditch the Dirt filter** Was the filtered water clear? Did they filter more than 100ml in 5mins?
- **Research** Did they find out about contaminants in water? Did they suggest ideas on how to make their filtered water safe to drink?

Fill in the table below and total the scores

[illegible]