



ENGLISH HERITAGE  
EDUCATION

KS2

# CAN SCIENCE SAVE THE CELL BLOCK?

RICHMOND CASTLE

LESSON 1

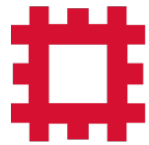


## WE ARE LEARNING TO:

- Use science to **explain** why the graffiti on the walls in Richmond Castle is getting damaged.
- **Predict** what will happen to the graffiti if it is not protected.
- **Understand** how conservation techniques can reduce the threat to historic buildings.



Part of the graffiti on the walls of the cell block at Richmond Castle.



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# STARTER

DISCOVER THE STORY  
OF THE CELL BLOCK...

# RICHMOND CASTLE AND THE CELL BLOCK



The 19th-century cell block was built next to the 12th-century keep.



One of the cells inside the block.

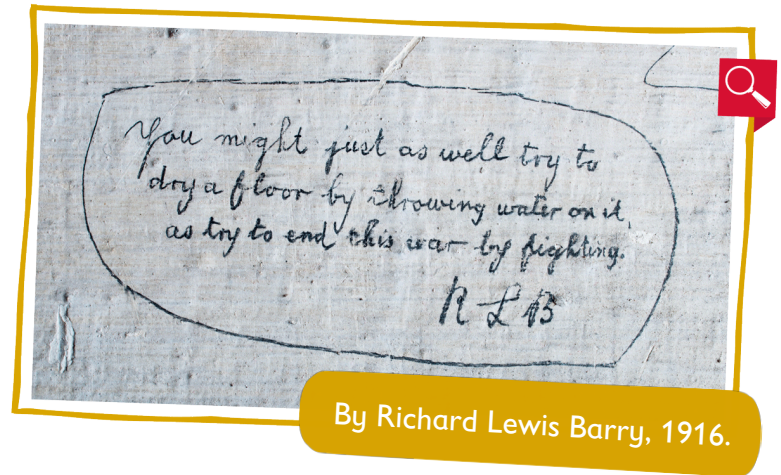
## THE GRAFFITI IN THE CELL BLOCK



By John Hubert (Bert) Brocklesby, 1916.




By William Thomas Angrave, 1916.



By Richard Lewis Barry, 1916.

## WHY DO WE NEED TO PROTECT IT?

G.  R.

**"ENGLAND  
EXPECTS  
EVERY MAN  
TO DO HIS  
DUTY"**

AND

**JOIN THE ARMY  
TO-DAY**

Poster published in 1914 by Parliamentary Recruiting Committee. Te Papa (GH016013)



Dyce Camp, 1916, showing eleven of the Richmond Sixteen.  
© Religious Society of Friends (Quakers) in Britain

### CHALLENGE TIME

Talk to your partner:  
why do you **think**  
English Heritage should  
protect the graffiti?



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RICHMOND CASTLE

[www.english-heritage.org.uk/visit/places/richmond-castle](http://www.english-heritage.org.uk/visit/places/richmond-castle)

## PROTECTING THE GRAFFITI

### DR PAUL LANKESTER – CONSERVATION SCIENTIST

My job at English Heritage is to make sure that the environment in our historic places is as safe as possible for the objects and artefacts. I use scientific equipment to monitor **temperature**, **humidity** and **light**, so that each is at the correct level. The wrong levels of any of these things may cause damage to historic objects.



I need your help. We need to find out if the environment in the cell block at Richmond Castle is right for protecting the graffiti.



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# INVESTIGATE

THE ENVIRONMENT OF  
THE CELL BLOCK

# WHAT'S THE PROBLEM?



1

The cell block walls are painted with limewash (calcium hydroxide).



The graffiti is drawn on the walls of the cell block.

2



3

The limewash is flaking off the walls.



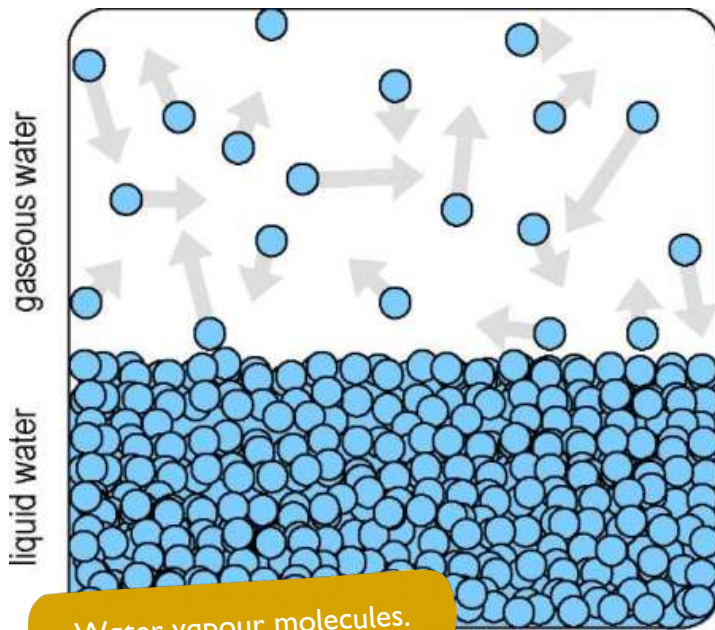
When the limewash flakes away, the graffiti disappears with it.

4



## WHAT WE ALREADY KNOW

We believe the flaking might be caused by salt in the cell block walls reacting with moisture.



Water vapour molecules.

Water vapour  
in the air  
= moisture in  
the cell block.

**DID YOU  
KNOW?**

**Humidity** is the  
amount of water  
vapour in the air.

?



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## EXPERIMENT 1

WHAT HAPPENS WHEN  
SALT REACTS WITH  
MOISTURE?

# EXPERIMENT 1: EQUIPMENT AND METHOD

## Equipment

- measuring cylinder
- container of water
- beaker
- salt
- teaspoon
- pencil
- stopwatch/timer



## Method

- Add one teaspoon of salt to 100ml of water.
- Stir it for 3 minutes.
- Record on your worksheet what happens to the salt.



## CHALLENGE TIME

**How** will your group make sure it is a fair test?

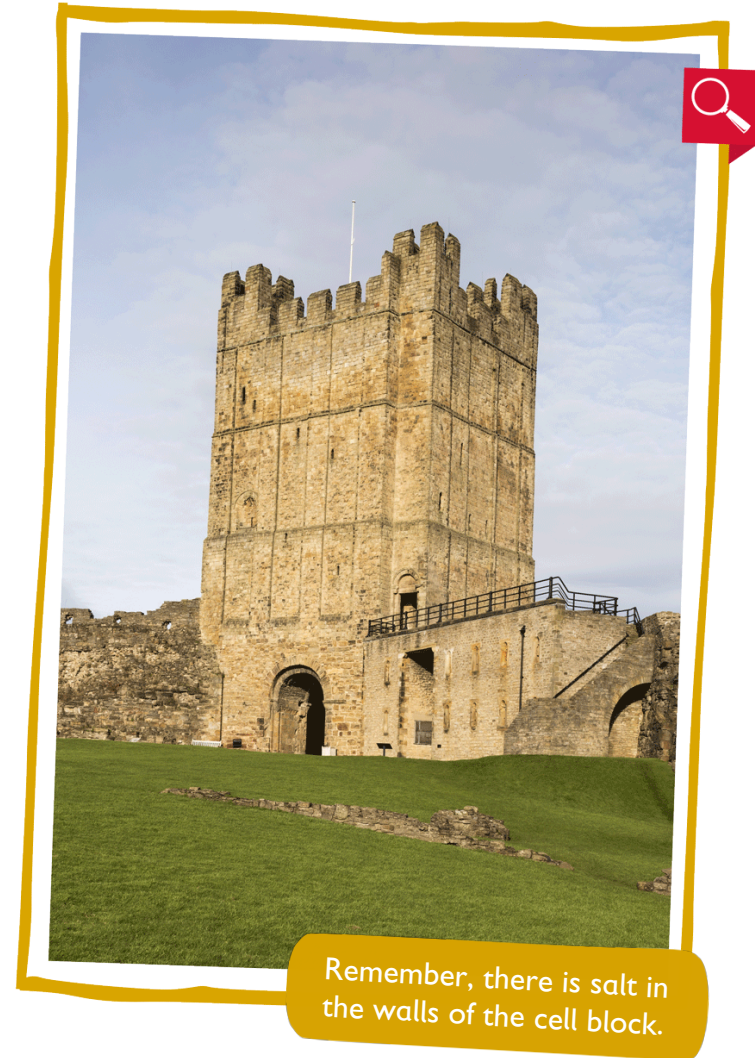
## RESULTS: WHAT HAPPENED?

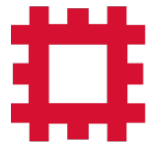
- When the salt reacted with water, the salt \_\_\_\_\_.
- Salt is \_\_\_\_\_. This means it \_\_\_\_\_ in water to make a \_\_\_\_\_.

soluble, dissolves, solution, dissolved

### CHALLENGE TIME

**Discuss** in your group: how will dissolving affect the graffiti?





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## CONCLUSION

WHAT HAVE WE  
DISCOVERED?

## CONCLUSION

When moisture gets into the cell block, the salts in the limewashed walls dissolve or liquefy.

This is not a stable environment for protecting the graffiti.



Next lesson:  
What happens when  
the moisture dries out?



The damaged limewashed walls.