The logo for English Heritage Education, a red square with a white grid pattern.

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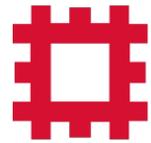
KS2

# CAN SCIENCE SAVE THE CELL BLOCK?

RICHMOND CASTLE

LESSON 2





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# STARTER

WHAT DID WE FIND OUT?

## RECAP: WHAT DID WE FIND OUT?

The cell block at \_\_\_\_\_ Castle used to hold prisoners, including conscientious objectors during the \_\_\_\_\_ World War. Some people in the cells drew graffiti on the \_\_\_\_\_.

English Heritage needs to protect the graffiti. Dr Paul the conservation scientist asked us to help him find out why the \_\_\_\_\_ is flaking off the walls.

Choose from these key words:

dissolving, Richmond, salts, moisture, dissolve, First, walls, limewash



## RECAP: WHAT DID WE FIND OUT?

He suggested that \_\_\_\_\_ in the limewashed walls are reacting with \_\_\_\_\_ in the cell block.

In our first experiment, we found out that salt reacts to moisture by \_\_\_\_\_. We concluded that moisture in the cell block would cause salts in the walls to \_\_\_\_\_.

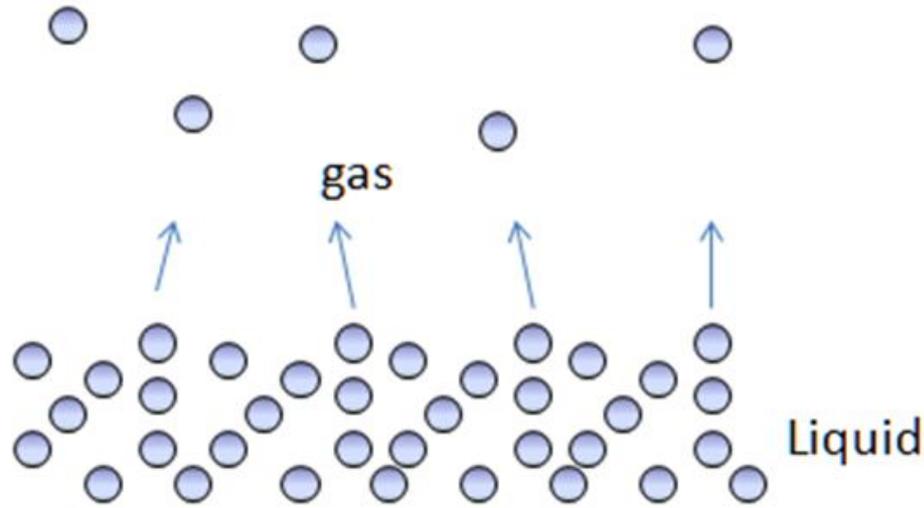


Choose from these key words:

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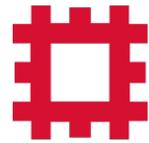
We know that salts dissolve in moisture. However, on a warm or dry day, the cell block walls will dry out and the moisture will evaporate.

What happens to the salts when the moisture evaporates?



**DID YOU KNOW?**

**Evaporation** is when a liquid turns into a gas.



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## EXPERIMENT 2

WHAT HAPPENS TO THE  
SALTS WHEN MOISTURE  
EVAPORATES?

## EXPERIMENT 2: EQUIPMENT AND METHOD

### Equipment

- hairdryer
- Petri dish
- the beaker with your salt water solution from Lesson 1



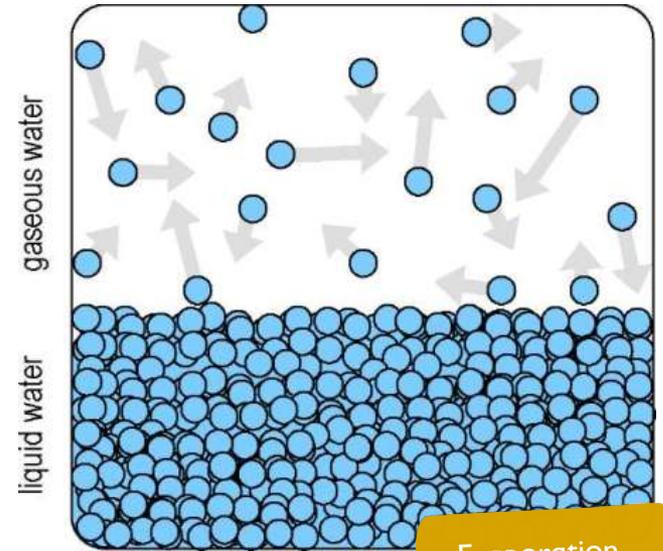
### Method

- Stir your salt water solution in the beaker to make sure the salt is dissolved.
- Pour some of the solution into a Petri dish.
- Heat the Petri dish gently with a hairdryer.
- Record what happens to the water and the salt on your worksheet.



## RESULTS: WHAT HAPPENED?

- When heated by the hairdryer the water **evaporated** and became **water vapour**.
- The salt did not evaporate. It was left behind, separated from the water.
- This is called **separation**.
- Without the water, the salt changed from a solution to salt crystals. This is **crystallisation**.



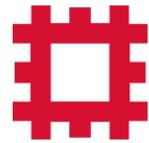
Once the salts are crystallised, they still absorb (soak up) moisture.

When something absorbs moisture, it is called hydration.



Crystallised salt.

When the salts hydrate, they get larger and when the moisture dries out, they get smaller again. Hydration, and evaporation, cause the salts to change shape.



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## ANALYSIS

WHAT DOES THIS MEAN  
FOR THE GRAFFITI?

## ANALYSIS

We have found out that when the amount of moisture changes, the salts in the limewashed walls will **dissolve**, **crystallise** and **hydrate**.



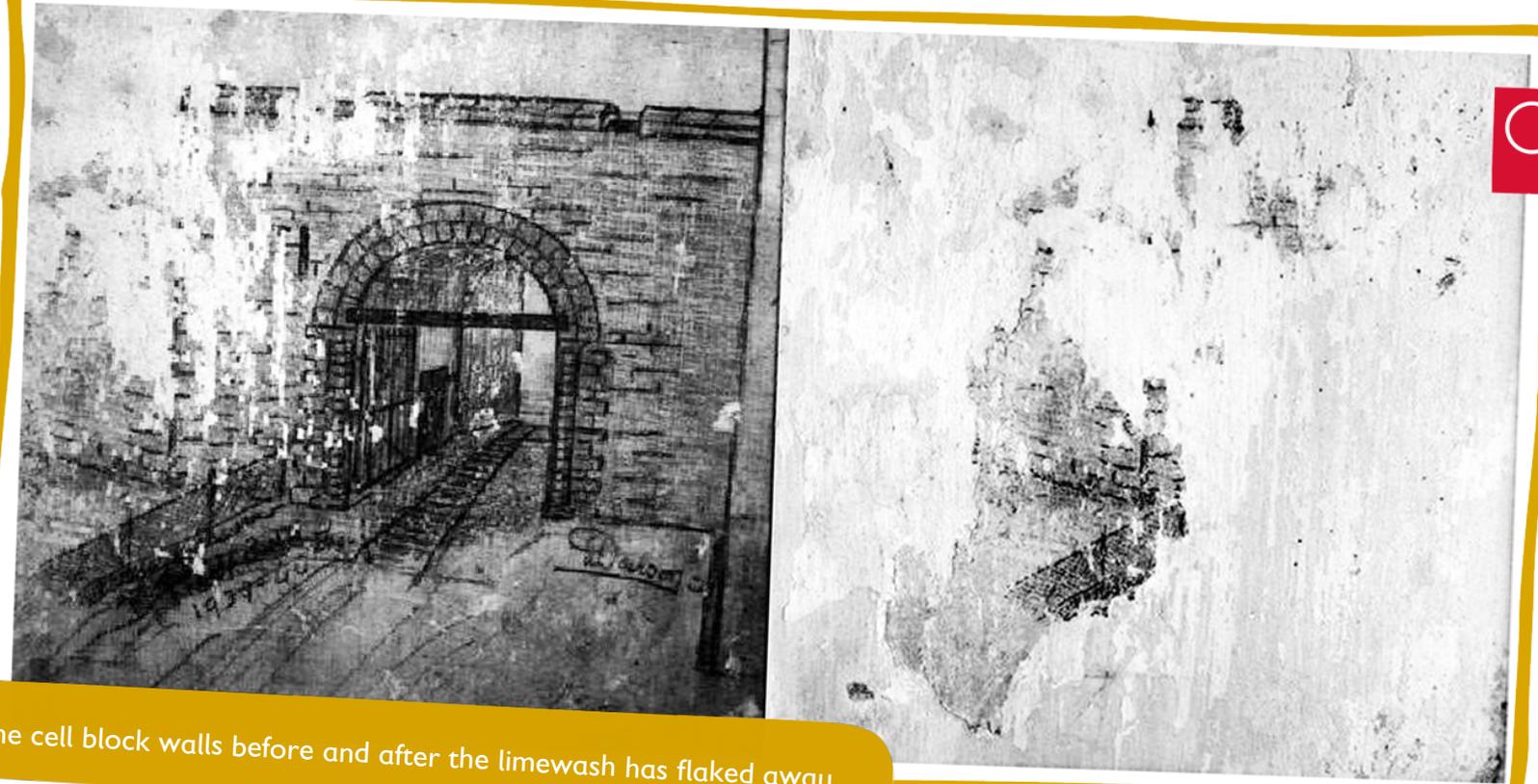
Salts in the limewashed walls in the cell block.

### CHALLENGE TIME

Think, pair, share:  
How will these changes to the salts affect the graffiti?

## ANALYSIS

- When the salts in the limewashed walls of the cell block **change shape**, they cause the limewash to flake off.



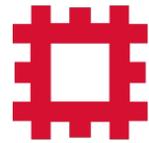
The cell block walls before and after the limewash has flaked away.

## ROLE PLAY

- In pairs, come up with a short role play of a news reporter interviewing Annie and asking her what is happening to the walls in the cell block.
- The interview should include a description of what is happening to the salts in the limewashed wall. Think about how Annie might feel about disappearing!
- Perform your role play to the class!



A drawing of Annie Wainwright, the fiancée of one of the inmates in the cell block.



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## CONCLUSION

WHAT HAVE WE  
DISCOVERED?

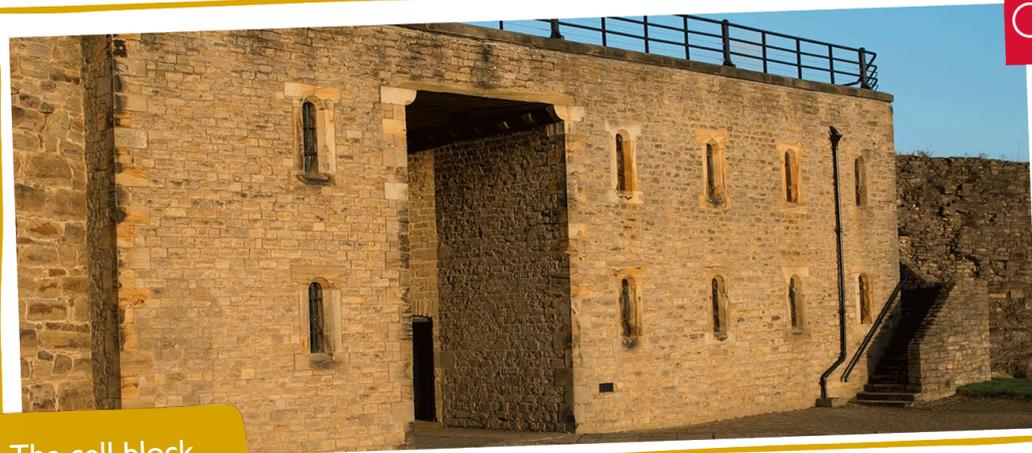
## CONCLUSION

Changes in the amount of moisture in the cell block cause the salts in the walls to change shape and this causes the limewash in the walls to flake away, destroying the graffiti.

To protect the graffiti, we need to think about how to control the amount of moisture in the cell block.



Next lesson:  
What causes moisture levels in the cell block to change?



The cell block.