

# SELF-LED ACTIVITY

## CAN SCIENCE SAVE THE CELL BLOCK?



KS2

### Recommended for

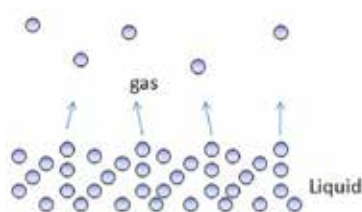
KS2 (Science, History)

### Learning objectives

- Understand the principles of solubility, humidity, condensation and evaporation in relation to the damage to the cell block walls.
- Conduct experiments and collect data to predict the behaviour of matter in the varying conditions in the cell block and answer a scientific enquiry about how to stop the damage to the cell block walls.
- Understand some of the threats to historic buildings and how conservation is important for protecting the historic environment.

### Time to complete

60 minutes



Evaporation occurs in the cell block.

### SUMMARY

This sequence of scientific experiments will help students investigate the scientific principles behind the disintegration of the graffiti in the cell block, and how it might be protected. Use the **Can Science Save the Cell Block? slide presentations** to guide you through each experiment.

### LESSON 1

**Starter:** Introduce the Richmond Castle cell block using the information in this Learning Pack, explain who was imprisoned there and look at some of the graffiti they drew. Students watch the video of the graffiti and discuss the need to preserve it. Meet Dr Paul who asks the students for help in investigating the environment of the cell block to discover how we might protect the graffiti.

**Main:** Explain how the graffiti has become damaged: salt in the lime-washed walls is reacting with moisture in the air. Experiment 1: What happens when salt reacts with moisture? Students add water to salt and mix to create a solution. Remember to keep your salt water solutions for next lesson. Results activity: Students fill in the gaps to explain what happened.

**Plenary:** Students conclude that salt dissolves when it reacts with moisture and that this is not a stable environment for the graffiti on the walls.

### LESSON 2

**Starter:** Whole-class recap activity: fill in the blanks to remind students what they learnt last lesson.

**Main:** Explain that in dry weather the moisture in the cell block will evaporate. Experiment 2: What happens to the salts in the walls when the moisture evaporates? Students use a hairdryer to heat the water from their Petri dish from Lesson 1. Results activity: The salt separated from the water and crystallised. Dr Paul explains that the salt crystals will also hydrate. Class discussion: How will the salts dissolving, crystallising and hydrating affect the graffiti? Explain that as the salts in the walls change shape, they push off the thin layer of limewash. This flakes away and the graffiti is lost.

**Plenary:** Role-play activity: interview 'Annie' in the wall. Students conclude that changing level of humidity causes the salts in the walls to change shape, which damages the graffiti.

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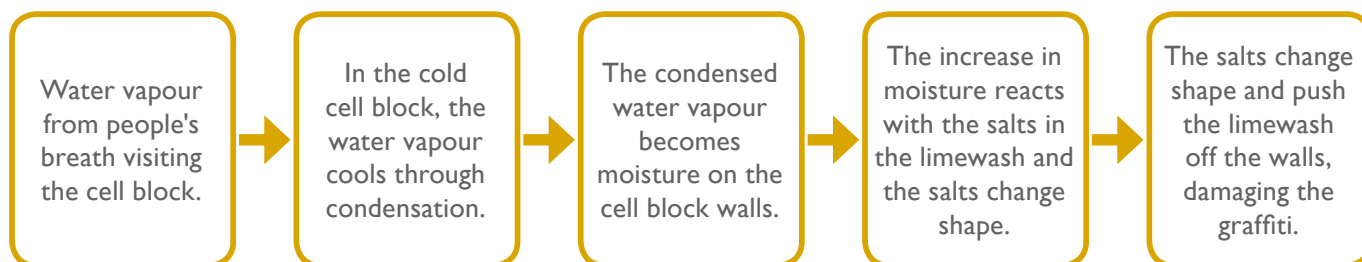
### LESSON 3

**Starter:** 'Find the link' activity: students connect each picture with damage to objects from 'wear and tear' that people inflict over time. What impact might people have on the cell block?

**Main:** Experiment 3: Students discover how breathing onto a colder surface condenses water vapour into liquid moisture. The more people breathe, the more moisture condenses. Molecule movement activity: Students act out the change of state from gas back to liquid. Students complete the flow chart to explain how people visiting the cell block will have an impact on the graffiti.

**Plenary:** The humidity level of the cell block needs to be stable. Students conclude that letting people into the cell block will change the humidity level and damage the graffiti. Students come up with ideas about how to stabilise the environment and watch a video that explains the action that English Heritage is taking. If it works, hopefully people can visit the cell block again one day.

#### COMPLETED FLOW CHART



#### MORE LEARNING IDEAS

You could explore the scientific processes that apply to the cell block further by conducting a salt crystallisation experiment, growing salt crystals from a boiling salt water solution, or growing salt stalactites from two beakers of salt water solution.

# CAN SCIENCE SAVE THE CELL BLOCK?



## LESSON 1

1. What happens when salt reacts with water?

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## LESSON 2

2. What happens to the salt when water evaporates?

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## LESSON 3

3. What happens when you breathe on the glass dish?

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4. Complete the flow chart to explain how people visiting the cell block will damage the graffiti:

