

# KS2 Castles STEM Resource

LEARNING



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## Introduction

The aim of this pack is to help teachers approach a self-led visit to a castle in a creative, confident and imaginative way. The activity suggestions are flexible and can be carried out in a number of ways. We encourage teachers to select and adapt the material to ensure it meets topic and year group needs.

## Booking a visit

Did you know that self-led visits to Cadw sites are free to education groups attending education establishments in the European Union?

The following guidelines are for staffed castles only. If you are visiting a castle that is not staffed you do not need to book. To book your free visit, please follow these simple steps:

Please book your visit at least five working days in advance. Telephone the site to check the availability for the date you'd like to visit. Once you have agreed a date and time with the site, complete the online booking form.

We also offer interactive, curriculum-linked education activities at selected sites. Booking guidelines and other resources can be found on the Cadw learning pages [www.cadw.wales.gov.uk/learning](http://www.cadw.wales.gov.uk/learning)

## Health and safety

Teachers and group leaders are responsible for carrying out risk assessments prior to the visit, in accordance with guidance issued by local education authorities. We offer free teacher familiarisation visits to enable teachers to write the risk assessments and plan activities before bringing a group to the site. The learning pages on the Cadw website offer advice for planning your visit and site specific information.

## Castles and the curriculum

We have included a curriculum map to support teachers' planning. The map highlights how the activity suggestions in this pack are relevant to learning in Key Stage 2 and how they link to the National Curriculum for Wales. The activity suggestions also support the delivery of Cwricwlwm Cymreig. They provide pupils with opportunities to develop and apply their knowledge and understanding of the cultural, economic, environmental and historical characteristics of Wales.



## Castles and STEM in Key Stage 2

Study of Welsh castles enriches work in STEM subjects and provides children with an environment in which to explore real life scientific, mathematical, technological and engineering opportunities and challenges. Visiting a castle can provide children with a context in which to learn and extend their understanding. The suggested activities in this pack provide a snapshot of ideas for meeting skills in STEM subjects whilst visiting a castle and in the classroom prior to and following a visit.



## Before your visit

### Activity Suggestions

#### Route planner

Before you go investigate the geographical location of the castle you intend to visit. Locate your school and the castle on local maps and plan your route.

#### Think about:

- How will you get there?
- How far away is it?
- How long will it take you to get there?
- How much it will cost?

Locate the castle on a digital map.

#### Think about:

- What does the area look like on the satellite image?
- What do you notice about the landscape?
- Can you find important landmarks?
- Can you locate physical and human features?
- Does the castle make use of natural features?

Report your findings back to the class in a number of ways; you could present your ideas in a PowerPoint presentation. Make the most of your journey to the castle and look for landmarks along the route. Add what you have spotted to your report.

#### Take a risk

Before you go make a list of the possible hazards you may encounter on your visit and think about the actions you could take to reduce the risk of injury. E.g. you will find uneven floor surfaces around the castle and to reduce the risk of tripping and hurting yourself you could wear sensible walking boots.

Create a 'Risk Assessment Table' with potential 'hazards', 'injuries' and 'actions'. Write a list of things you may need to take with you to keep you safe on your visit. E.g. sensible shoes.

Next research the hazards you would have faced in the past when the castle was in use. Think about the actions you would need to take then to reduce the risk of injury. E.g. the castle may have been surrounded by a moat. To reduce the risk of falling into the deep and murky moat and drowning you would need to make sure you carefully crossed it when the drawbridge was down.

Again create a 'Risk Assessment Table' with potential 'hazards', 'injuries' and 'actions'. Write a new list of the things you would need to take with you to keep you safe on your visit. E.g. A shield. Compare the two tables and lists.

#### K-W-L. Know - Want to know - Learn

Launch your castle topic and steer thinking and questioning with a K-W-L chart. Before your visit to a castle brainstorm: What do I know about castles? What would I like to find out about castles? Complete the chart and list everything you know and would like to find out. Following your visit or at the end of your topic, complete the final column asking: What I have learned about castles?

#### Comparing castles

There are many different castle styles including; motte and bailey, square keep and concentric castles. Research three castle designs and create a PowerPoint presentation to explain, describe and compare each example. Include a title slide, an open layout with bullet points, labeled diagrams and photographs. You could also include transitions, animations, hyperlinks and sounds.



*You will find activity sheets at the end of this resource.*



## Built to last

The following activities give pupils an opportunity to explore the reasons why people built castles. They encourage children to think about castles as places built to defend and protect as well as places for people to broadcast immense power and control over others.

**Maths:** Skills: Solve mathematical problems. Communicate mathematically.  
**Range:** Measure and Money, Shape, position and movement  
**Design and Technology:** Skills: Designing. Making. System and control

**Other curriculum links:**  
**English:** Oracy  
**ICT:** Skills: Find and analyse information  
**History:** Skills: Historical knowledge and understanding. Historical Enquiry  
**Geography:** Skills: Locating places, environments and patterns. **Range:** Study the town and country, tomorrow's citizens.

## Turbulent times

### Key Questions:

*Why did people build castles? How did people defend castles? How did people attack them?*



### Engage:

Many castles were built during a time of conflict. They were built to keep hold of land that was captured and then kept to rule the defeated enemy. Castles were ferociously defended and attacked.

### Develop:

Split the class into two groups - 'Attackers' and 'Defenders'. In pairs and with a plan of the castle, explore it through the eyes of an attacker or a defender.  
**Attackers:** Find the weak spots in the castle. **Think about:** How would you storm the castle?  
**Defenders:** Find the weak spots in the castle. **Think about:** How would you defend the castle?  
There are many ways in which to use the 'Turbulent times' cards, found at the end of this resource. We have included two activities you may wish to do.

### 1. Find the evidence

Choose an attack card and search the castle for the area that it relates to. Observe the area carefully and talk about how this area could be attacked. Decide the most effective way to defend it.

### 2. Turbulent times tactics

In small groups create two teams - 'Attackers' and 'Defenders'. The aim of this game is to outwit the opposing team using the 'Turbulent Times' cards and to win the battle with the best defence or attack methods. Each team read their cards carefully. Talk together about the most effective attack/defence methods. Choose three cards that you all agree are the most effective, (you also need to think about what you opponent might choose). Both teams reveal your cards. Debate together which methods chosen would win the battle. E.g. if the 'defenders' have chosen to use the portcullis and the 'attackers' the battering ram, decide which team would come out on top.

### Reflect:

Where is the weakest point of the castle? How do you know?

**In class:** Explore the Cadw learning pages to find out more about why castles were built. Create a 'Trick list' for attackers or a 'Trick list' for defenders with imaginative ideas for attacking or defending a castle.

## Defence inspector

### Key Questions:

Does the castle have good defences? How can I find out?



### Engage:

Use your maths skills to investigate whether the castle is strong enough to withstand an attack. Become a 'Defence Inspector'. With clipboard in hand conduct a castle survey to test the castle defences. Will the castle withstand an attack and pass your inspection? You will need a plan of the castle and measuring equipment including a stopwatch to find out.

### Develop:

- Estimate then measure the thickness of the walls. Where is the thickest wall found? Why?
- Estimate the height of the walls. Where is the tallest wall found? Why?
- Estimate then measure the size of the doors and windows. How far are the windows from the ground?
- Measure the position, size and number of arrow slits. Are there enough?
- Estimate then measure the distance from the keep to various rooms or areas around the castle e.g. from the keep to the kitchen, the keep to the chapel, the keep to the bedchambers etc.
- How long will it take an attacker to move around the castle? Measure the time it takes for them to reach each room or area of the castle. Remember they would creep slowly, carefully and quietly once within the castle walls to stay undetected.
- Estimate then measure the perimeter of the castle walls. How far will an attacker have to travel around the castle? How long will it take?

### Reflect:

Will the castle survive an attack? Has the castle passed your inspection? Explain your reasons.

**In class:** Create a database with the information you gathered during the inspection. Create a map of the castle with grid references pinpointing the castle weak spots.

### How high?

Is the tower or wall too high to measure? How can you find out the height of the tallest wall or tower? Bend over and look through your legs!

Walk far enough from the tower or wall to a place where you are just able to see the top of it from your upside down position. The distance from where you are standing to the bottom of the tower is about its height.

The angle that is formed as you look between your legs is about 45 degrees. The angle between the tower or wall and the ground is about 90 degrees. Remember what you know about the angles and sides of a triangle? Now you can work out the height of the tower. The height of the tower and the distance from the tower to where you are standing is about equal. Find the tallest tower. Find the tallest wall.



## Explosive stuff!

### Key Question:

How does a catapult work?



### Engage:

I am an Engineer and my skills are needed for building castles and for defending and attacking them. My favourite job is designing and constructing the siege engines. You need a great imagination to be an engineer. Would you like to help me? Do you have what it takes?



### Develop:

#### Take the Catapult Challenge.

You are engineers and your mission is to design, make and test a catapult to help attack the castle. You need to test your catapult in a 'Castle Siege'.

#### Choose a catapult challenge

1. Make the most accurate catapult to hit a specific target.
2. Build the fastest catapult to destroy a castle wall in the quickest time.
3. Construct a catapult that launches objects the furthest.
4. Design the most unusual catapult with features never before seen.

#### Designing your catapult - Tips

**Remember** your chosen challenge.

**Make** a prototype - create a simple lever catapult using Lego or K-nex.

**Research** Use the Internet to find ideas. Search for catapult designs and images.

**Plan** Draw your design ideas. Add labels and a list of what you will need to make your catapult.

**Test** Does it work?

Think about your chosen challenge.

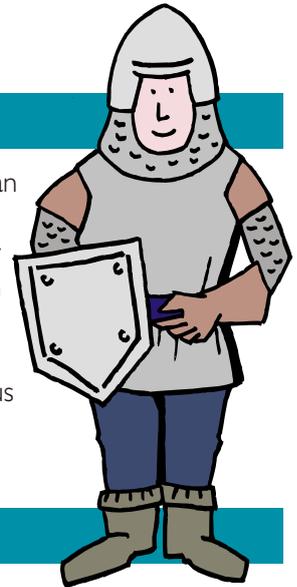
**Evaluate** Can you improve it?



## Mission impossible?

### Engage:

Before a siege, we attackers plan our tactics very carefully. The castle is always well guarded by day and night. However, within the castle walls a network of spies and messengers pass on important information to help us plan our attack.



### Develop:

Take the 'Castle Spy Challenge'.

You are a spy and your mission is to make a map of the castle to aid our attack. With a plan of the outer walls make a record of all the internal features and obstacles. Include the position of rooms, the stairs, doors, windows, passageways, fireplaces etc. Make a note of where guards will be positioned and whom we are likely to find in the castle rooms. Label your map carefully and accurately to help us succeed when we storm the castle. Are there any secret passageways or tunnels? Remember to move around the castle with care and secrecy. Shhhhhhh!

### Reflect:

**Discussion point** - What would happen if a spy got caught?

**In class:** Research the castle's story and the characters that played a key role in its history such as Owain Glyndwr in North Wales or Lord Rhys in South West Wales. Create a timeline of events or retell the story on a storyboard.

## Tools of the trade

The following activities give pupils an opportunity to explore how castles were built. Children will consider common features, materials used, construction methods and why castles changed over time.

**Maths:** Skills: Solve mathematical problems. Communicate mathematically.  
Range: Measure and Money. Shape, position and movement. Handling data  
**Design and Technology:** Skills: Designing. Making. Rigid and flexible materials  
**Science: Skills:** Communication. Enquiry. Developing. Range: The sustainable Earth. How things work.

Other curriculum links:  
**English:** Oracy.  
**History:** Skills: Historical knowledge and understanding. Historical enquiry

## Grand design

**Key Questions:** *How were castles built?  
What will my castle look like?*



### Engage:

I am a castle master mason and it is I who was responsible for building the castle you see today. My castle designs are masterpieces, works of beauty and I am the best castle builder the world had ever seen. I am calling upon all budding architects to search my castle from different angles and heights and take inspiration and ideas to influence your own castle designs. Look carefully at the architecture, structure, shape, line, angle and elevation.



### Develop:

Use a plan of my castle as you explore. Sketch in detail or take photographs of the features you would like to use in your design. Sketch the structural parts of the castle inside and outside including how windows, floors and ceilings were constructed. Add detail to your designs and label the materials you would like to use. Decide whether you will design a castle to show off to others or to defend against attack, or both

### Reflect:

Add a modern feature to your design. Describe its purpose and how it defends or shows off depending on the purpose of your castle. Share your ideas with the group.

**In class:** Research how castle design has developed over the years and use those ideas to tweak your design. Draw a detailed plan of your castle. Decide on the materials you will use to construct it and then build it. You could use: paper, cardboard or clay. You could also use construction kits such as Lego, K-Nex and Meccano. Explore the Cadw learning pages to find out more about castle designs.

## Materials I spy

**Key Questions:** *What are castles made from? What materials will I find at the castle?*



### Engage:

At first castles were made from mounds of earth and wood. But as weapons developed so did the materials used to build castles and stone was the material of choice.



### Develop:

Work in groups to identify different materials found throughout the castle. E.g. building stone, soft stone, metal, wood, glass. When you have identified a material e.g. soft stone, carry out careful observations of the material. Describe its properties e.g. easy to carve. Describe the way it is used around the castle, e.g. decoration.

#### Think about:

- Is it original or not?
- How can you tell?
- Why was this particular material used here?
- Is there evidence of different materials that are no longer visible?
- Why?

Carefully record your findings on the Materials I spy grid.

### Reflect:

**Discussion point:** Is there a material that you have not found in the castle? Why do you think that is? Which material is most commonly found? Collect and present data to find the answer.

**In class:** Investigate where the materials you have found at the castle came from and how they were transported to the site.

## Missing

**Key Questions:** *Where and how was wood used in the castle? Why has much of the wood used in castles not survived?*



### Engage:

You may have discovered that much of the wood that was used in and around the castle when it was built is missing. To find out why involves detective work. Detectives examine and collect evidence; they hunt for clues to find answers to tricky questions. Work in small teams of detectives and explore the castle to find evidence of where and how wood was used.

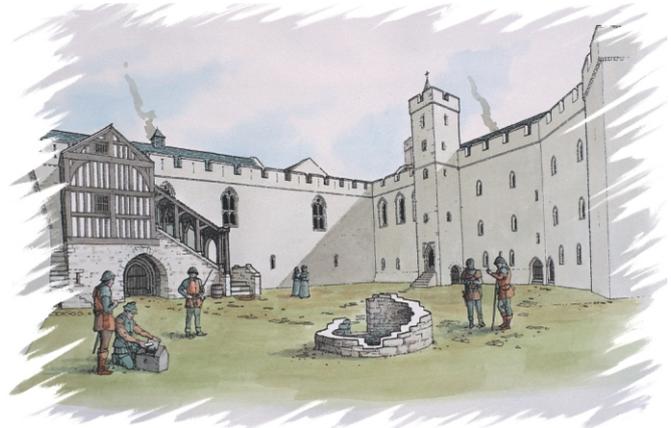
### Develop:

Teams should make a list of where wood was used. Think about: fuel, buildings, furniture and weapons. Don't forget that everyday objects may have been made out of wood too, e.g. buckets, bowls, utensils and tools etc. Which team has the longest list?

### The 'hole' truth

Holes can give us clues about where wood was used in the castle.

- Wooden beams were inserted into round putlog holes in the stonework to support scaffolding when the castle was being built or repaired. You may find them on the outside of the castle.
- Holes were made in stonework for wooden drawbars to enter to act as a door bolt. You may find them near doorways especially the main door.
- Joist holes were cut into stonework and wooden beams were inserted to support floors.
- Postholes may be found in the ground. They were dug and beams were inserted. They may show you where a wooden building once stood.
- You may find pivot holes near the entrance where a wooden drawbridge was lowered and raised.



### Reflect:

Share your discoveries. Discuss why the wood has disappeared. Has it decayed, was it vandalised or destroyed by fire or has it been replaced with a different material?

**In class:** Conduct a series of controlled experiments to see how wood deteriorates in different conditions, e.g. immersed in water, frozen, heated, buried, dropped. Compare it with other materials such as stone. Research how scaffolding was used around the castle and design your own using lollipop sticks, modeling sticks, straws or construction kits.



## Investigate arches

**Key Questions:** *Why do castles have arches? How strong are they? Why are they that shape?*



### Engage:

The arch shape is very strong and has been used for thousands of years. A force from above pushes down on the keystone at the top of the arch. The force then pushes outwards onto the wedge shaped stones and is channeled down the sides of the arch to the pillars on either side, then to the footers at the bottom. The abutments stop the pillars from spreading.



### Develop:

In pairs, stand opposite each other and form an arch by placing your palms together at shoulder height and leaning towards each other. Carefully slide your feet back as far as you can. Can you feel pushing (compression)? Where? The force you are feeling is the same force created in an arch, an outward and downward force along the sides and the base.

In pairs, search for arches around the castle. How many can you find? Where are they used? When you have found a good example use it to explain to your partner how it works.

### Reflect:

Choose an arch you have found and carefully draw it in detail. Label: keystone, footers, abutments and load. Record what your arch is supporting.

**In class:** Work in teams and build an arch using the observational drawings you made during your visit to help you. Test the strength of your arch, describe the forces involved and write instructions for others to build it. What is your arch made from?

## Use the force

**Key Questions:** *What is a force and what can it do?*



### Engage:

As you explore the castle invisible forces will surround you. You cannot see them so you will have to use your powers of deduction to spot where they are or where they were in the past.

Remember: A force is needed to get things moving, to change their direction, to change their speed and to stop them.

### Develop:

Explore the castle and make a list of the invisible forces that surround you.

### Think about:

#### Moving objects

Pulleys or windlasses - they would have been used to move heavy stone, raise and lower the castle drawbridge or draw water from a deep well

Winches - they were used to raise and lower the portcullis or lift other heavy objects

Levers - they were used in siege engines to fire heavy objects at speed during an attack

#### Stable objects

Structures - bridges, walls, pillars, columns, towers, arches, buttresses and the arrangement of stones

### Reflect:

**Discussion point:** How does the castle stay up and why does it not fall over? What are the forces you found around the castle and what role do they play?

### In class:

Design and make a feature from the castle, e.g. a working drawbridge and demonstrate the force acting on it.

## Just the job

The following activities encourage children to think about the people who worked within the castle. They will explore the hustle and bustle of castle life through the people who worked there.

**Maths:** Skills: Solve mathematical problems. Communicate mathematically. Range: Number, Measure and Money, Shape, position and movement, Handling data

Other curriculum links:

**English:** Oracy.

**History:** Skills: Historical knowledge and understanding.

**Geography:** Skills: Locating places, environments and patterns. Investigating. Range: Study living in Wales: their local area.

**ICT:** Skills: Find and analyse information

**Art and Design:** Skills: Understanding, Investigating. Range: Understanding, Investigating, Making

## All in a day's work

**Key Question:** How easy is it to get around the castle?



### Engage:

You have just started a new job as the castle errand boy/girl. In your role you are expected to know your way around every part of the castle. You are expected to know all the best routes to get your job done quickly.

### Develop:

In pairs use compass points and directional language to write instructions on how to reach different parts of the castle.

**Test it out.** Give your instructions to another pair. Did they get the job done or did they get lost?

### Reflect:

How easy it is to get around the castle?

**In class:** Draw a map of the castle on squared paper and use coordinates/grid references to show where features are located.

## Castle careers top trumps

**Key Questions:** Who had the best job? Who had the worst job?



### Engage:

**Think about:** Who worked in the castle and what tasks did they have to undertake? Who do you think had the best job? Rate the castle jobs and create a deck of 'top trump' cards.

A template for this is included at the back of this resource.

### Develop:

Choose your categories: Skill - Job satisfaction - Salary - Stamina - Grossness. Rate each job by giving each category a score. The best job will have the highest score.

### Reflect:

**Discussion point:** Who has the best and worst job?

**In class:** Research more castle jobs and add these to your deck of top trump cards. You could include your own categories and a design for the back of each card. Play your top trumps cards.



## Party planner

**Key Question:** What were castle feasts like?



### Engage:

Can you find the great hall? Magnificent feasts would have taken place in the castle's great hall. Important guests were invited, quality linen would have adorned the tables and an array of fine food was served. For the people working in the castle it was a very hectic time.

### Develop:

The king is due to visit the castle and a feast is planned in his honour. It is your job to plan it! Look around the great hall and use your imagination to picture the sights, smells and sounds during one of the feasts. **Think about:** a guest list, the invitations, a seating plan, the menu, entertainment, decorations, staff required to serve the king and the other guests. Jot down your ideas and make a plan of the feast.

### Reflect:

**Discussion point:** How much you think the feast would cost.

**In class:** Create a feast budget and make a detailed record of how much a modern day castle feast will cost. Research the cost of the food, printing the invitations, hiring a band or a disco, employing waiters and buying the decorations. Set a budget; compare prices and choose the best value for money.

## Heraldry

**Key Question:** What is heraldry?



### Engage:

When a knight was in the heat of battle it was important to be able to identify a friend from an enemy. To be recognised knights decorated their shield and tunic with a coat of arms. A Herald designed the coat of arms making sure that no two were the same. Their designs were filled with symbolism.



### Develop:

As you explore the castle, collect symbols and shapes that interest you or mean something to you. Use the castle as inspiration to create your own personal coat of arms. It could represent your characteristics, personality and values, your hobbies, your favourite things and important events. Use the shield template found at the end of this resource to sketch your thoughts and ideas.

### Reflect:

Can you design a coat of arms with two lines of symmetry or with rotational symmetry?

**In class:** Refine the sketches you made during your visit and create your shield in your chosen medium. Look at each other's coat of arms and guess who they represent. Where do you find coats of arms today? Research and compare coats of arms from different time periods.

## Home sweet home

Castles were much more than powerful strongholds. Within the solid walls they were also a home to many people. The following activities allow children to investigate the castle as a place to live.

**Maths:** Skills: Solve mathematical problems. Communicate mathematically. Range: Measure and Money, Shape, position and movement, Handling data

**Design and Technology:** Skills: Designing.

**Science:** Skills: Communication. Enquiry. Range: Interdependence of organisms.

Other curriculum links:

**English:** Oracy, writing

**History:** Skills: Historical knowledge and understanding. Historical enquiry

**Geography:** Skills: Locating places, environments and patterns. Investigating. Range: Study living in Wales: their local area.

## Go go gadget go

**Key Question:** How did people heat and light castles?

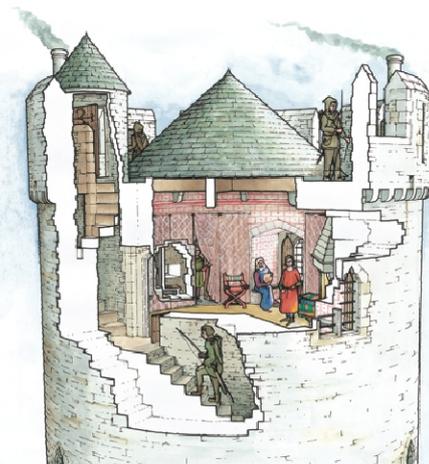
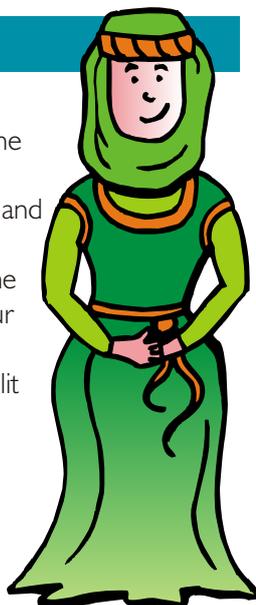


### Engage:

The castle can be a very dark, draughty, damp and cold place to live. We use heavy blankets, feather mattresses, fur covers and tapestries on the walls to give us some comfort and warmth, but in the winter my chambers can freeze. Some days I find it quite impossible to see my embroidery, even sat in the window seats.

### Develop:

I commission you to invent a new machine or gadget that will supply the castle with warmth and light. Your invention must be 'attack proof' too and should be designed with medieval materials in mind. As you explore the castle make notes and jot down your ideas. Can you find any clues in the walls to suggest how the castle was lit and heated?



### Reflect:

Come together and share your ideas. **Think about:** How can you improve your invention?

**In class:** Draw a detailed diagram of your new invention. Label it before writing an instruction manual with diagrams and labels explaining how it works. Give your invention a name.

## Castle for sale

**Key Question:** What are the castle's dimensions?



### Engage:

The Lord wishes to move and sell his castle. He has instructed you, a medieval estate agent, to list the castle for sale.

I need more space!



### Develop:

Make notes about the castle for a sales brochure. Measure the width and length of each room and then calculate the area and perimeter. Draw accurate floor plans and label each room. Measure the land around the castle.

### Reflect:

How many square metres of floor space does the entire castle have?

**In class:** Create a brochure with floor plans and photographs of the castle. In your brochure provide a map with the castle accurately located on it and record its distance from the nearest amenities e.g. schools, bus and train stations and shops etc. Give directions to buyers on how to get to the castle. Include how much you think the castle is worth.

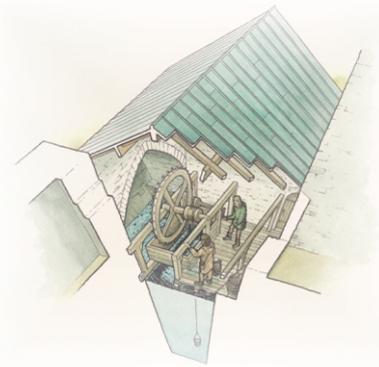
## Water watch

**Key Questions:** How did the castle get its water? How was water used in the castle? How was water moved around the castle?



### Engage:

Castles needed a water supply and they were usually built on land with a spring or well. Waste-water was sometimes dumped into a moat or cesspit and the stench would help to defend the castle from attack. The water supply was often sabotaged during an attack and a siege could be lost if the water supply was cut off.



### Develop:

**Investigate:** How did people bring water into this castle? Where was it used? What was it used for? How was waste-water disposed of? Attempt to follow the route of water as it was brought into the castle. Move around the castle and into the rooms where water was used. Can you find evidence of: a well, a spring, cistern, basin, garderobe, latrine, moat, river etc? Follow the water as it left the castle. Where was the waste-water disposed of?

### Reflect:

**Discussion point:** What did the people who lived and worked in the castle drink? Why did they not drink water?

**In class:** Research how water is used at your school or home. Investigate where the water from you tap comes from and the journey it takes to reach you. Follow the journey water takes after it has been used and becomes waste. Compare the water supply in Wales to other countries.

# KWL

Know

Want to Know

Learned


## Turbulent times

### Resource cards

**Attack:** Siege - Surround the castle so no-one can enter or leave

**Attack:** Siege engines - Fire stones and rocks over the walls and into the castle

**Attack:** Water - Block the water supply to the castle.

**Attack:** Battering ram - Break down the castle door or the thick stone walls

**Attack:** Archers - Fire arrows at the soldiers in the castle

**Attack:** Siege Tower - Get men over the castle walls and protect your soldiers as they climb the ladder

**Attack:** Fire - Set fire to the wooden door, the food store or any wooden part of the castle

**Attack:** Ladders - Climb the high walls or cross the moat

**Attack:** Surprise - Attack at night and look for places to hide

**Attack:** Tunneling - Dig under the castle foundations to weaken the walls so they collapse

## Turbulent times

### Resource cards

**Defend:** Castle location - Build on high ground to give you great field of vision of the surrounding area and make tunneling and access difficult.

**Defend:** Portcullis - Create an extra barrier and lower the portcullis.

**Defend:** Supplies - Stock up on the essentials so you can't be starved out.

**Defend:** Battlements - Protect soldiers on the curtain wall walkway.

**Defend:** Ditches - Make access to walls and doors difficult by digging ditches.

**Defend:** Archers - Shoot the enemy through the arrow loopholes.

**Defend:** Sally Port - A small entranceway that is closely guarded. Soldiers can pass through quickly to mount a sudden attack.

**Defend:** Main door - Bolt shut the door and lower the bar behind it.

**Defend:** Murder holes - With attackers at the gate pour scalding hot sand or rocks through the holes.

**Defend:** High, thick curtain walls - Build your walls high with a walkway along the top for shooting.

**Defend:** Allow archers to shoot through the gaps while remaining safe behind the stone.

**Defend:** Surround the castle with a moat filled with water and waste.

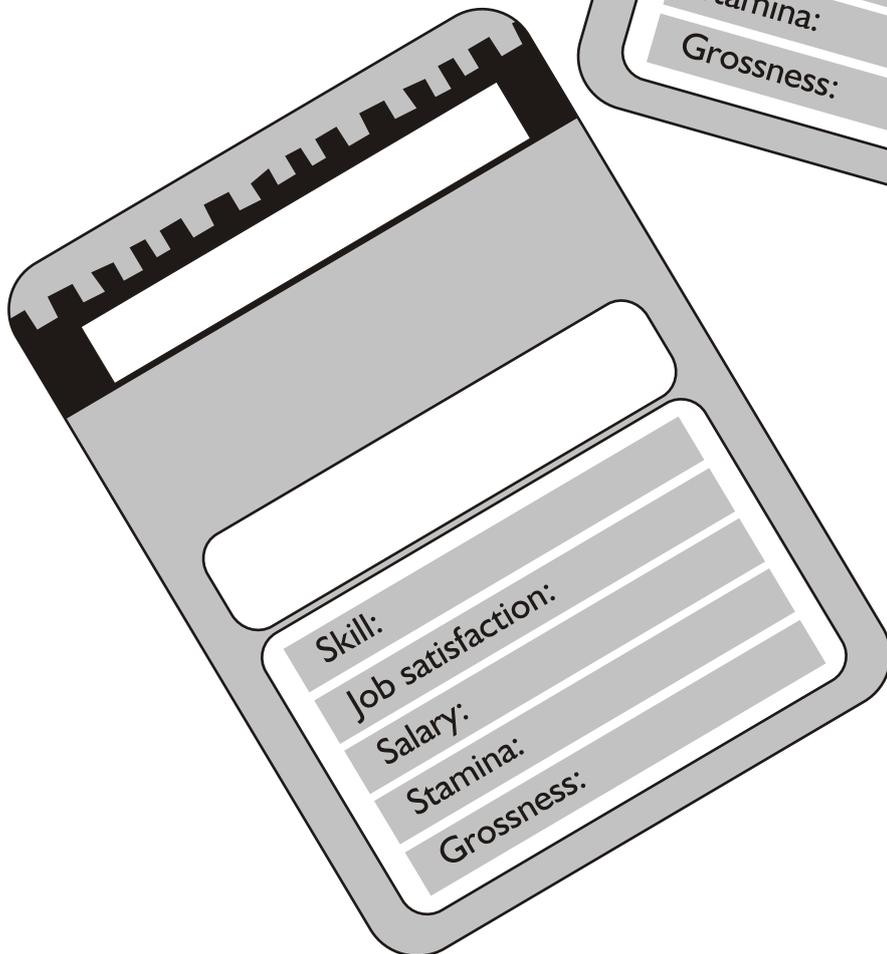
**Defend:** Drawbridge - pull up the drawbridge to protect the main door.

# Materials I spy

Object	Material	Properties	Uses	Original

# Top trumps

Example



# Heraldry

Shield template

