Travel & Transport

Canal & River explorers

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Overview of the pack

An introduction to travel & transport with a focus on canals and waterways.

Key Stage 2 National Curriculum links

- **Geography** – describe and understand key aspects of human geography including types of settlement and land use, economic activity and distribution of natural resources.
- **History** – events beyond living memory which are significant nationally or globally and contrast changes over time.
- Links with **English, Maths & Science** will be indicated where they occur.

Other resources

- Canal & River Explorers' "Building & Carrying" topic pack (link to website)

Learning objectives

- Understand the roles of waterways as transport networks now and in the past.
- Develop awareness of types of transport for both people and goods.
- Understand how canals have developed over time.
- Understand the relationship between transport links and human settlement.

Success criteria

- All will increase their knowledge about how canals have developed over time and the importance of waterways. They will have worked independently, in pairs and groups.
- Most will understand how the development of canals affected people & goods and will understand why different types of waterway developed.
- Some will be able to explain this accurately and in detail to others.

Prior learning

- Use the "Building & Carrying" topic pack on the Canal & River Explorers' website.
- Identify local waterways and other transport networks on a map.

Follow up

- A field trip to a local canal or canal museum.

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Additional teacher information and discussion points on each slide to help you:

Slide 1 Key words

- Print out for a wall or table display as a reminder to learners while they work.
- Other words include:
    - Year 1 & 2 - rain, same, sea, tree, leaf, bird, cool, air, cloud.
    - Year 3 & 4 - breathe, continue, discover, enquire, experience, explore, experiment, interest, beginning.
    - Year 5 & 6 - analyse, atmosphere, demonstrate, develop, especially, gradual, identify, illustrate, inhabitant, investigate, manufacture, moisture, observe, organise, rapid, volume.

Slide 2 Sensory words

- These words support descriptive writing, and are useful for writing about the journey of goods along a canal. Pupils could discuss and write their own list thinking about smell, sight, sound, touch, and taste.

Slide 3 How does your class get to school?

- This activity can be something brief to start pupils thinking about transport in general or as part of a wider activity encompassing maths and research. Pupils could produce their own spidergram.

Slide 4 How does your class get to school?

- Link to maths topic and display the information in graph or chart form. Compare distances travelled to school, other age groups in school or other schools. Pupils work individually, in groups or as a class to collect the information. Use IT data handling programmes.

Slide 5 Other forms of transport

- Pupils work individually then share with a partner before reporting to the class. Add more circles if required. Answers could include canoes, donkeys, hot air balloons etc. Pupils could create a spidergram on paper or using IT. Categorise answers – water transport, air transport, road transport etc.

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Slide 6 Travelling from A to B

- Provide pupils with a map of the local area. The pupils should be asked questions such as "How do you get from the school to the library?", "How do you get home from the shops?" and "How do you get from home to the nearest large town?". Drawings could accompany their answers.

Slide 7 What do you think?

- Discussion points either as a whole class or in groups. In the 1700s the solution was the building of canals.
- Rivers provided some areas with water transport, but the rivers weren't always located where they were needed because they are natural features of the landscape. Not all rivers could take boats as some were too shallow, fast flowing or their depth varied too much. In some cases rivers were already being used by millers or other industries to turn water wheels and they had ancient rights over the water.
- The man-made canal system provided a smooth route for goods around the country. Canals could not be built to go everywhere. They were built to join up key areas of production (coal mines, mills, quarries) with large towns or ports.
- One packhorse could carry about 100kg of goods. One horse drawn narrowboat could carry about 20 tons, which is equivalent to about 200 horses. Pupils could think of a way of representing pictorially the difference between the loads carried by one packhorse and one horsedrawn boat. Either a barchart – e.g. one square = 10kg or as a picture of a horse carrying one box and a bot carrying 200 boxes.

Slide 8 Building canals

- This slide is for older pupils or for extension work.
- Building a canal was a hard and dirty job that took many years to complete. First a channel was dug out; the sides had to be supported by wooden frames in deeper sections so they didn't collapse in on the navvies (the builders). It was dangerous work and they didn't have the tools and protective clothes available to builders today.

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Slide 8 Building canals (continued)

- Once the channel had been dug, it had to be lined to make it waterproof so all the water didn't soak into the ground. The materials used for building depended on what was available in the area. Limestone could be used to build the sides but in many places clay kept the water in the canal. Stone or brick and wood were used to build locks.
- Finally the canal could be filled with water. They used water from nearby rivers and streams redirected into the canal. Rain and sometimes reservoirs would have been used to keep the water topped up.
- Pupils could make a model canal in a tray of sand or soil. What happens if they pour water into their canal? Investigate lining the canal with different material to find out how waterproof they are. Try clay, plasticene, cardboard, stones, paper etc.
- Pupils could list the properties of clay and why it makes a good lining - waterproof, easily available, long lasting, will mould to the shape of the canal

Slide 9 Moving goods

- Horses didn't lose their jobs when traffic moved to the canals as carts and carriages were still needed. They also pulled the boats along. They could pull much heavier weights on the water than they could on land.
- Pupils could investigate pulling loads on different surfaces including water. Use a force meter to pull a weight along the ground then on water (on a polystyrene tray boat).

Slide 10 Think of three reasons for and against building canals

- Use this information for discussion before completing the activity.
- An alternative would be to have a debate in which a group of local people decide whether a canal should be built locally or not.

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Slide 10 Think of three reasons for and against building canals (continued)

- Lots of people were involved in deciding if a canal was going to be built: landowners, business owners, local people and the government. When the idea of building canals for transport became popular in Britain in the mid 1700s and the first canals were successful, everyone wanted one and plans to build canals popped up in lots of places. Businessmen decided that they wanted to build a canal to make more money. The support of others was important and public meetings were held to convince people it was a brilliant idea. The idea was then sent to the government, and members of Parliament discussed whether or not they would allow the canal to be built. They then said 'no' to the idea or passed an Act for the canal to be built. Only after this could any building work start.
- Some landowners along the canal's length were not happy about a waterway cutting their land in half. They demanded that expensive bridges were built to connect the two sides; some built elaborate bridges, such as that at Severn Acre, then charged it to the canal company to get their own back for the canal being built. Landowners and businesses paid for the canal and owned shares in it. This meant that by buying shares in the canal company, they got some of the profits if any extra money was made (hopefully more than they'd paid for the shares). This only happened when the canal was working. Other people hoping to earn money could buy shares too.

Slide 13 Draw, write and present

- Pupils could research online or using information from the Canal & River Explorers' "Building & Carrying" topic pack.
- Use the following headings as a scaffold if necessary.
    - Type of boat.
    - How the boat got its name if known.
    - Who would use it.
    - Where/when/why it would be used
    - Personal view. What pupils think about the boat – e.g. have they been in a canoe? What was it like? Would they like to go on a tall ship? Why? Why not? What makes a tug particularly useful? Have they seen one? Have they had a holiday on a canal?
- Pupils could present their information in different ways – as a poster, an advert or as a talk to the class.

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Slide 14 Guess the type of boat?

- The photographs are of different boat types – A = Tall Ship, B = Fishing Boat, C = Tug, D = Barge, E = Canalboat, F = Narrowboat.

Slide 15 What are the problems of travelling along a canal?

- Before showing the slide present the pupils with the problem that the early canal builders had of getting canals up and down hills, across valleys, from one side of a hill to the other. How many ways can they think of solving this problem?
- Show the pictures once the pupils have thought of their own ideas - go round the hill, tunnel, lock, aqueduct etc.
- Encourage the pupils to come up with imaginative, inventive solutions - the chances are that the early canal builders also thought of them, such as boat lifts.
- Pupils can draw and write about their own inventive solutions to the 'hill' problem.
- Discuss the photographs with the group and analyse how each of the things illustrated were built to solve a problem of transportation. These are small pictures to discuss briefly. Following slides show more detail.
- Pass on the 'fascinating facts' from across England and Wales:
    - 1,654 locks
    - 54 tunnels
    - 3,115 bridges
    - 417 aqueducts
    - 91 reservoirs

Slide 16 Aqueducts

- Aqueducts carry water over something, such as a valley, river, road or railway. Aqueducts have been used to carry water since Roman times; however, they didn't carry boats until the 15th century.
- Canal aqueducts carry the navigation channel.
- The first boat aqueduct to carry boats in Britain was on the Bridgewater Canal. It carried the canal over the River Irwell and into Manchester and was still high enough to allow sailing boats to pass underneath on the river.

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Slide 17 Locks

- Locks allow boats to move up or down a hill. You can find this image of how a lock works, and others, along the Rochdale Canal.
- Flight - A flight is a group of locks that are near each other but have a pound (section of water) in between each one. It means that all the hard work comes at one point rather than constantly getting on and off the boat.
- Staircase - Less common are staircase locks, where two or more locks are placed together, with the top gates of one forming the bottom gates of the next. Staircase locks are often used when there is a steep climb over hills.

Slide 18 Tunnels

- At first tunnels were avoided as they were difficult and expensive to build. As engineering techniques improved, it became increasingly possible to build challenging structures. Nevertheless they were kept as narrow as possible as this was cheaper and easier to build.
- Before talking about legging. Set the pupils the problem of working out how to get a boat through a tunnel where there is no towpath for the boat. Encourage them to come up with creative (and even crazy) solutions e.g. horse swims in the water, a giant wind turbine at one end, lots of birds tied to the front - the possibilities are only limited by their imagination. They can draw and write about their solutions.
- Legging - Boaters had to 'leg' through most tunnels using their feet. This was because many narrow tunnels had no towpath running through them (as it was cheaper and easier to build them without). The boat horse had to walk over the top of the tunnel while the crew did the hard work.

Slide 19 The Anderton Boat Lift

- A water tank, complete with the boat on it, is lifted into the air until it joins the section above or below.

Slide 20 Weather

- Weather could be an obstacle as the canals could become frozen. A long time ago, when winters were much harsher people used to skate on canals.
- Emphasise not to try walking on ice today.
- In 1963 many of the canals froze over. This contributed to the end of the canals being a viable form of transport.

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Slide 22 Tell the story

- Pupils should write a story about travelling along a canal to deliver some heavy goods (they name) from its place of origin to a port or factory.
    - Part 1. A description of the goods being carried on the canal boat and where the goods are being taken. Who is on the boat with you?
    - Part 2. Details about the journey along the canal including up to three obstacles encountered and how they are overcome e.g. a tunnel through a big hill. (Lots of detail here needed about how it feels to be in the total dark using your feet to push your way through a small enclosure).
    - Part 3. How do you feel at the end of your journey? Would you do it again?

Slide 22 Tell the story (continued)

- Follow up activity. Investigate how canals are used today. Leisure activities including canoeing, fishing, walking on the towpaths, bird spotting etc. This could be initiated by a visit to a local site near your school.
- Include a map, a field sketch, other drawings etc. and some of the pupil's own thoughts. Use the Canal & River Explorers' Build A Trail interactive game (link to website).
- Think about the countryside and also about the towns such as Birmingham where the centre has been transformed using the canals as a centre piece.