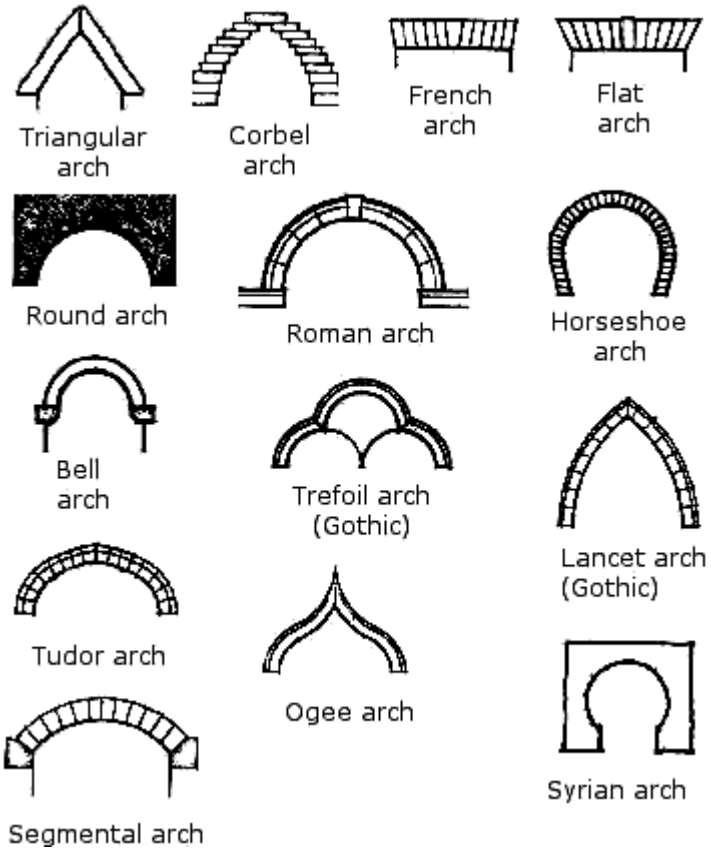

**Answer Sheet for Questions on the Map**

| | |
|---|---|
| • Where do the railway tracks outside M Shed go to? | To the east, the tracks run all the way to St Mary Redcliffe, travel underneath the church in a tunnel (which can still be seen near the Ostrich pub today) and to Temple Meads. To the west, the tracks run all the way along the harbourside, and once crossed the river at 'Butterfly Junction' before re-joining the main line into Somerset at Ashton Court.<br><br>The railway used to link up with the ships to carry goods such as timber from all around the world. |
| • How many different arches have you seen? Draw the different types.<br><br>• Could you build a straight bridge from stone? Why? | Here is a selection of different types of arches:<br>.....<br>  <br><br><br>You can, but only over short distances. A long span would likely collapse under its own weight, as there is a limit to how much friction force can be resisted at the sliding faces between the stones. Notice that the straight "arches" shown in the pictures above use stones that are thicker at the top than the bottom. As |

| | |
|---|---|
| | long as sufficient force is applied to both ends the stones cannot fall out.<br><br>The mortar that holds the stones together is very weak in 'tension'. You could build an arch bridge out of stone, as the mortar would all be in 'compression'. Modern straight bridges are built from reinforced concrete, which has a very high tensile strength. |
| • Which of Brunel's famous bridges spans the gorge? | Clifton Suspension Bridge! |
| • What features could you have in the city centre to improve air quality and create a better environment? | Ban or control the most polluting lorries from the city centre.<br>Introduce a congestion charge.<br>Lobby the government for better legislation to improve the performance of engineers.<br>Build a consolidation centre, allowing bulk items to travel to the depot by trains or lorries, then transferred to smaller, less polluting vehicles to be brought into the city centre.<br><br>*Please submit your suggestions to Mayor George Ferguson!*<br>***www.bristol.gov.uk/ideaslab*** |
| • How could you improve the city for pedestrians and cyclists? | Close roads in the city centre to traffic (happened last year in Bristol during "Make Sunday Special" events).<br>Lower the speed limit.<br>Built 'short cuts' for cyclists to make it a faster way to travel.<br>Remove parking spaces.<br>Build on-road cycle lanes.<br>Improve public transport.<br>Enforce bans on parking on pavements, which makes it unsafe for pedestrians and cyclists.<br>Create traffic-free zones in city centres- this has been done in over 70 German cities.<br><br>*For more ideas see here:*<br>***http://ec.europa.eu/environment/pubs/pdf/streets_people.pdf*** |
| • The water level in the River Avon at Bristol can vary by 12 metres a day! What can engineers do to protect Bristol from flooding? | Build flood gates to hold back water at high tide, dredge the New Cut to increase its capacity, lower the level of the floating harbour to hold water during times of high tide, build sustainable urban drainage to attenuate storm run-off, hold water in the upper catchment of the river avon by planting trees, attenuate/store sea water in the estuary by building new mudflat/saltmarsh. |

| | |
|---|---|
| • Can you spot signs of water pipes along your walk? Give the numbers of one you find. | The numbers on the hydrant posts are the pipe diameter and the distance away so you know where to look for the access cover. Though that the distance can be in feet or metres depending on how old it is!  |
| • What other pipes and services are underground beneath your feet? | Foul/storm/combined sewer, clean water supply pipes (small distribution mains and large trunk mains which can be 1.2m in diameter!). Fibre optic/internet, gas mains |