

Activity Plan & Guidance (KS2/KS3)

Overview: Dating back to 1874, the Roundhouse was originally stables for 50 horses and a store for the Birmingham Corporation. The Birmingham Corporation was a bit like the city council of today. A £3m project has been taking shape since 2013, to restore and reimagine the Roundhouse for a range of new uses and to open it up to the public. In this pack you will find maths-based challenges perfect for the Year 6 to Year 7 transition, all focused on the restoration of this historically significant site.

NB. The figures and costs in these activities are a guide for educational purposes. They are not an accurate reflection of the true figures and costs of the project.

Learning Objectives

- To learn about what the Roundhouse was once used for as well as the restoration project
- Use mathematical knowledge to complete Roundhouse themed challenges
- Apply knowledge of volume, area, money and percentages to solve real-life problems

Resources

- Reviving the Roundhouse PowerPoint Presentation
- Reviving the Roundhouse Activity Pack (includes fact sheets and activity sheets)

Activity

Starter

Use the 'Reviving the Roundhouse PowerPoint Presentation' to introduce the Roundhouse and give real-life context to the maths-based activities.

Activity: Fact Stations

Prepare 5 'fact stations' in your classroom. Each station should display one of the 5 fact sheets from the 'Reviving the Roundhouse Activity Pack':

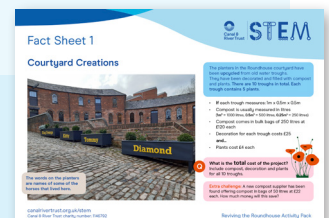
- Courtyard Creations;
- Window Workout;
- Office Space Income;
- Wonderful Wall Art;
- Brick Challenge.

Give the students a 'Reviving the Roundhouse: Activity Answer Sheet' to complete (they could work in teams or independently).

Students move around to each station and complete the relevant challenge. They will need to use the information provided on the relevant fact sheet to complete each task. *A completed answer sheet is provided on page 3 of this document.*

Activity: Scaling-up Wall Art

Once all 5 tasks are complete students could finish the session with the 'Scaling-up Wall Art Activity Sheet'. Using the grid drawing method students to scale-up a drawing of the horse wall mural by 200%. Students can colour in the design if there is time or have a go at creating their own image.



Differentiation

- For 'Fact Sheet 1: Court yard Creations' some students may need you to model how to find the volume of a cuboid as well as a prompt to convert m^3 in litres (this information is given in the bullet points on the fact sheet).
- Students who feel more secure may wish to complete the extra challenge on each of the fact sheets. The extra challenge is an extension of the main task and allows students to deepen their understanding of the problem.
- For a shorter or less intense session, split the class into 5 teams. Each team could undertake just one challenge. After completion, each team could present and explain their findings to the rest of the class maybe acting as heritage specialists on the given topic. They could explain what the task was and how they worked it out.

Suggestions

This resource provides an opportunity to spark interest and engagement in maths through real-life problems. The tasks involve a variety of maths knowledge (such as decimals, percentages, volume and money) so this is a good resource to use as a fun session at the end of Year 6 or as a transition to Year 7.

If you are near Birmingham why not organise a school visit to the Roundhouse to see the building and take a walk along the towpath? Alternatively, research a heritage restoration project that has taken place near your school. Find out how STEM plays a part in all renovation tasks and investigate STEM career roles.

Plenary

- Use ICT skills to look up the Roundhouse on [Google Earth](#) or [Google Maps](#).
- Ask students to imagine it's the 1870's and they are going to submit an entry for the building design competition. What shape would their building be? How would wagons get in and out during the Victorian era? What adaptations might they make for the horses? Use the historic map provided on slide 5 of the 'Reviving the Roundhouse PowerPoint Presentation' to help with the task.

Curriculum Links

KS2 Maths (Number – fractions (including decimals and percentages):

- Multiply one-digit numbers with up to two decimal places by whole numbers
- Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

KS2 Maths (Ratio and proportion):

- Solve problems involving the calculation of percentages

KS2 Maths (Measurement):

- Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units

KS3 Maths (Working mathematically):

- Consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots

Useful Websites and Resources

- [The Roundhouse website](#)
- [The Roundhouse in Birmingham \(Canal & River Trust\)](#)
- [Caring for our heritage \(Canal & River Trust\)](#)

Reviving the Roundhouse

Answer Sheet - TEACHERS ONLY!

Use the fact sheets to answer the following questions:

Courtyard Creations (Fact sheet 1)



Q What is the total cost of the planter project?

Volume of planter = $0.25\text{m}^3 / 250\text{lt}$

Compost cost for 1 planter = £120 Total per planter = £165

Cost for plants: $4 \times 5 = £20$ **Total project cost = £1,650**

Top tip: Start by working out the volume of a trough (L x W x H), this will tell you how much compost you will need in m^3 .

Extra challenge: Total per planter = £155
Total project cost = £1,550 **Saving £100**

Window Workout (Fact sheet 2)



Q What is the total cost to replace the windows?

Cost per window = £750

Cost for 40 windows = £30,000

Cost for fitters = £6000 **Total project cost = £36,000**

Extra challenge: New cost per window = £860
New total project cost = £40,400

Office Space Income (Fact sheet 3)



Q What would be the total income for 1 year?

Office 1 per year = £7320

Office 3 per year = £11,400

Office 2 per year = £10,560

Total income = £29,280

Extra challenge:

Office 2 for 6 months = £5,280

New total income = £24,000

Wonderful Wall Art (Fact sheet 4)



Q What is the total cost of the wall mural?

Wall area: $4\text{m} \times 1.5\text{m} = 6\text{m}^2$

Material cost = £282

Artist: $6 \times £60 = £360$

Total cost for mural = £642

Extra challenge:

$£642 \times 2 = £1,284$ take away 10%

Total cost for 2 murals = £1155.60

Brick Challenge (Fact sheet 5)



Q What is the total cost for the brickwork repair?

Bricks cost: $132 \times £4 = £528$

Labour cost: $11 \times £420 = £4,620$

Labour days: $132 / 12 = 11$

Total repair cost = £5148

Extra challenge:

New daily rate = £462

Total additional repair cost = £510