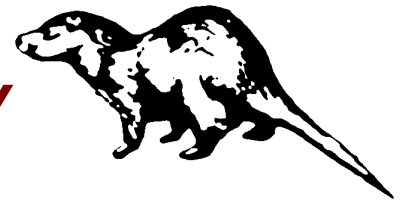


# NUFFIELD PRIMARY HISTORY



## ANCIENT GREECE

# ARCHIMEDES AND THE SYRACUSAN WAR

## TEACHERS' NOTES

This was the second lesson with a mixed Year 3/4 class in a small rural primary school. The head, Laura, and I had worked together for years. Laura's brief to me was to teach the literacy hour using the context of history. Laura told me that the children had already had all the standard Greek stories, so I thought Archimedes might be a good addition. Indeed, Archimedes is an excellent subject, as he covers science, mathematics and a range of other areas, including cunning plans to defeat enemy armies and navies.

The previous week we had taught a lesson about how Archimedes had solved the problem of the king's crown: was it solid gold or did it contain a base metal as well? We now moved on to a second case of problem-solving: how Archimedes had managed to beat off the attacks of the Roman navy upon his city of Syracuse.

For ideas and information about Archimedes and the Syracusan war, consult this wonderful website:

<http://www.mcs.drexel.edu/~crrres/Archimedes/contents.html>

### Literacy context

The key literacy idea was to take a specific text genre and use this as the model for teaching. The one I thought appropriate was the comic. Accordingly the lesson fell into three parts:

- developing an understanding of the comic genre
- working on Plutarch's account of how Archimedes solved the problem of fighting off the Roman navy
- the pupils transferring their ideas about the comic genre to the context of Archimedes and the Syracusan war.

The account of the teaching is based upon a tape recording of the lesson. It was quite salutary in illuminating how I had too often missed the correct responses of the children to my probing and prompting. Poor quality listening skills, alas.

### **Year group/class**

Mixed Year 3/4; 30 pupils in the class.

### **Teaching time**

One and a half hours.

### **Learning objectives**

For the children to:

- develop an understanding of the form and features of the comic genre and produce their own comics
- read a difficult and challenging text, using textbreaker methods
- understand the principles on which Archimedes' machines were based
- extend their literacy skills through extensive dialogue and interactive reading and discussion of text.

### **Key question**

How did Archimedes solve the problem of fighting the Roman warships?

### **Resources**

Beano comics, at least one per pair of children

Levers, pulleys, weights, ropes, i.e. the equipment you would need to make catapults and lifting gear as described in Plutarch's account.

Briefing sheet: *Archimedes and the Syracusan War*

Plutarch's account of Archimedes and the defence of Syracuse (Source A) – for teachers

Plutarch's account, segmented and rewritten for teaching purposes (Source B).

### **The teaching**

The first activity was to investigate the comic genre by analysing the Beano. We then used textbreaker techniques for reading difficult and

challenging texts, breaking into the briefing sheet *Archimedes and the Syracusan War* at the whole text level before moving on to word/sentence/phrase work. The Plutarch account (Source B) was treated differently, as we worked on each section separately before putting them together into an holistic story. In dealing with the sections we employed a large amount of expressive movement / mini-drama to bring the text to life. Finally, having made sense of the text in terms of it telling the story of the siege of Syracuse, the pupils used the comic genre to create their own understanding of a scene from the siege.

## Episode 1

*Focus: Setting the task – investigating the comic genre.*

I asked the children if they would like to read a comic – positive affirmation!

We handed out the comics and asked what we call the pictures inside them. ‘Sketches, cartoons?’ was the instant response. ‘Well done’. Then I outlined the class’s task.

- Investigating and analysing the cartoon genre:

What we are going to do is to work out how the artist, the person who drew the cartoon, the person who made up the story in the comic, actually did this, the way in which she or he produced the work.

- Modelling and implementation:

We will then use this as a model for our own cartoons and story.

- Resolution:

By 12.15 everyone will have produced his or her own comic of the story that we are going to look at this morning.

The class was given time to read the comics. This they did with enjoyment, and in silence!

## Episode 2

*Focus: Analysing comics; working out the elements that go into the Beano’s cartoons.*

The children now worked on a single cartoon each had chosen, trying to tease out what elements it contained. A fascinating 15 minutes followed. The transcript gives an idea of its thrust and focus. I went around the class, teasing out ideas:

JN            I want everybody to look at their comics and find a picture or sketch or scene and work out ideas. We will look at the kinds of things that you find in them.

PUPIL    A scene.

JN What do you call it?

PUPIL A picture.

JN What kinds of pictures are they?

PUPIL A cartoon.

JN What is the next thing you will find? We'll look at all the kinds of things you will find.

PUPILS A background.  
A person [character].  
Names.  
Writing.  
A speech bubble.  
Big writing.  
Titles.  
Noises.

By the end of the episode the pupils had identified over twenty different elements that give cartoons their identity, including adverbs.

When we had finished, I gave the class five minutes to go on reading their comics as I was exhausted.

### **Episode 3**

*Focus: Reading an information text – scanning, overall understanding.*

I had written a short briefing sheet to introduce the story of Archimedes and the Syracusan War. In making sense of it the techniques we used were scanning, skipping, underlining, and single sentence summaries.

The pupils were placed in pairs, with a good reader in each pair.

I explained that I wanted them to form a clear idea of what the text was about:

JN What I want to do is for you to go through this very quickly, skipping over any words you do not know; hop over anything that you cannot read.

I will give you a minute to do that: Ready, Steady, Go.

Any of you who have finished go through it again and underline any words that you do not know.

If you understand all the words, write at the bottom – write one sentence which you think sums up what you think the story is about.

Each pair worked on the text, and then read their summaries out to the class. We wrote them down on the blackboard. Typical summary sentences were:

- Syracuse's war against the Romans.
- Two children are visiting their uncle and their uncle is going to tell them about Archimedes who is a mathematician in Syracuse and he fought in the Syracusan wars against the Romans.
- It was a story about Archimedes in the war.
- Archimedes sunk the Roman ships with levers and pulleys.

#### **Episode 4**

*Focus: Shared reading. Explaining what was involved in the defence of Syracuse.*

The pupils read out each paragraph of Source B in turn. I asked the pupils what words and phrases meant, drawing upon the whole class's knowledge. For example, we talked about what was the name for the Roman ships [fleet, navy], and the term for the beak on the boats [ram].

On the board I drew a map of the city, showing the high walls around the land side and also along the harbour front. Jo commented, 'Like the walls of Troy'.

We talked about the city being like a huge castle, and how the Romans might solve the problem of attacking it. This was a driving, interactive, exploratory dialogue, building up the picture in the children's minds.

The problem is:

How did Archimedes use a lever and a pulley to stop the Romans?

#### **Episode 5**

*Focus: Working out how we could make a weapon using a lever.*

- Levers and catapults:

We demonstrated how a lever worked, using a ruler and a pivotal point. The children gathered round as we demonstrated.

Then I asked how a lever could be used to make a weapon:

JN        Who said catapult? Brilliant, here is a lever, a seesaw ...  
[demonstrated it].

How do you turn that into a catapult, that is, so that it can throw a stone or rock at the enemy?

The children talked in their pairs, pooled ideas and worked out that it needed a heavy weight on the short end to provide the downward force to move the long arm and thus propel the projectile.

IONE     Bang the end down.

JN        Yes, brilliant.

FRANK    You need a real big force to go down.

JN        So, we can see how Archimedes used a lever to make a catapult.

#### • Pulleys

We also investigated how a pulley works, and reinforced the fact that Archimedes had used levers and pulleys to make machines to sink the Roman ships. We had a long chat teasing out and defining the concept 'machine', not too successfully!

### Episode 6

*Focus: Reading a difficult and challenging text; making sense of the text – word and phrase level*

We finished reading the briefing sheet: *Archimedes and the Syracusan War*.

I told the pupils that Ignoramus had muddled up the extracts from Plutarch's account. Plutarch now needed their help to try and get them back into order. I handed out cut-up, rewritten extracts from Plutarch's account (Source B), telling the class that the pieces of paper had on them the story of how Archimedes had defeated the Romans.

The class was told that they would have to read the slips in pairs. We allocated an overlapping pair of lettered paragraphs to each pair of pupils: A–B, B–C, C–D, D–E, E–F, F–G. Anybody who finished was told to read H, and then help another pair.

### Episode 7

*Focus: Shared reading of the text, using inference, pupil contributions and teacher explanation to develop understanding.*

As a class we worked on building up a mental picture of what each paragraph was saying. We used sound and expressive movement to illustrate the meaning of the text, plus incremental definitions of words and phrases.

- Noise

For example, for the phrase: ‘a noise like thunder’, I asked the class to make as loud a thunder noise as it could.

JN Pathetic! Louder!

The class responded magnificently.

- Demonstration:

Our approach here is illustrated in our treatment of paragraph [B], which reads:

*A ship was often lifted up to a great height in the air (a dreadful thing to see), and was rolled to and fro, and kept swinging, until the sailors were all thrown out, when at length it was dashed against the rocks, or let fall. [B]*

JN Emily, please read B. [She reads it out]

Can anyone demonstrate what is happening to this ship? This is the boat [ruler]. It is on the end of this great hook. Dom, show us, here’s the ship, it is a ruler. Go on reading it. Move it to and fro, come and do it, show us. [Emily takes the ruler] Emily is dashing it against the rocks.

Constructed, joint meaning of words:

JN Can someone tell me what the word ‘rule’ means.

PUPIL Like king of Greece.

JN Other words?

IONE You own the land.

LAURA You won the land and you own everything on the land.

JO Rulers invade.

EMILY You like tell people what to do.

CAMILLA If you are the Government you rule.

JN Well done!

- Expressive movement

JN What does the word ‘paralysed’ mean?

Everybody stand up. Everybody stand up. [I walked around the room.] You can’t move. You are paralysed. Freeze, you can’t move, you are all paralysed.

## Episode 8

*Focus: Summarising the paragraphs, putting the summaries in order to re-create the story.*

I told the pupils that they would have to work out the correct order of the slips to be able to re-construct the story.

They would have to tell the story of their paragraph in six to ten words.

We would read out the slips in the order of the story.

We agreed to begin with G.

**JN** Could the group that did paragraph G tell us in your own words what Plutarch says?

**CAMILLA** This story took place 300 years ago in the city of Syracuse in Sicily.

We worked through the paragraphs in order, putting up each group's contributions on the board. We ended up with the story in this order:

**G** This story took place 300 years ago in the city of Syracuse in Sicily.

**E** The general used his ships to attack. The walls guarded the city.

**H** The Syracusans were all scared.

**C** Rocks were thrown on the ships.

**A** Torturing their ships.

**B** Ships were lifted high and were rolled to and fro.

**D** They thrust huge poles and dropped rocks on the ships.

**F** He [the general] told his ships to go because of the danger.

We then read out the story – the children were pleased with their work.

## Episode 9

*Focus: Implementing the model – children using the comic genre to tell their own story.*

I explained that the class would have ten minutes to draw a cartoon of any one scene in the story, using as a model the comic genre. We went through in detail the things that a cartoon might contain. Each pupil had a Beano to refer to.



JN           What I want you to do is to choose one scene from the story and to draw your own cartoon using the ideas we looked at earlier about cartoons. One picture. Ten minutes. Name on top of the paper. Open up your comic to get ideas of how to create a cartoon.

PUPIL    So we can do any scene?

JN           Yes, any scene from the siege.  
Like lifting the ships out of the water. You include sounds, action, speech bubbles, thoughts, levers and catapults, boxes of text titles, movement, what's happening then – and next. Not just the picture, we want the words as well.

## Episode 10

*Focus: Pupil review of what they had been doing.*

I asked the class what subjects we were doing. The responses were:

- About Roman wars
- Science
- We were doing History/English/Literature
- A bit of art, sketches, cartoons.

The work was continued and finished in a later lesson.

## Learning outcomes

The children:

- gained conscious knowledge of the comic genre, through close observation, explicit discussion, and creating their own comics
- further developed their knowledge and understanding of Greek science, and how Archimedes' scientific machines had been used in history
- read a difficult and challenging historical text, and sequenced it to create a coherent narrative of past events.

## Reflection

The tape was a very, very powerful tool to assist my attempt to analyse and reflect on how well the pupils had responded to the lesson. I found the recording quite fascinating. There were lots of ideas milling around. Perhaps it is sensible to list what was going through my mind and influencing what I did.

**A Pupil knowledge focus.** The teasing out of the comic elements was based on the thought that children have a complex, sophisticated understanding of things that are in and central to their world.

**B Analysis, modelling, implementation** Consciously working on the Beano comic genre gave the lesson a clear focus and sense of direction.

**C Context** The history context enriched pupil perceptions and understanding, and application of the genre. The children drew upon what they already knew, and upon the information I fed in, to extend their understanding of words, phrases and ideas.

**D Literacy** We were dealing with literacy at many levels and phases at the same time – quite consciously working as a class on developing language as a tool in a multitude of ways.

**E Modes of learning:** enactive (drama); iconic (visuals); symbolic (words and signs). We consciously switched between these so as to transform meaning from one form to another, thus providing a multi-dimensional perspective to literacy.

**F Guided discourse** This lesson built around me guiding the children towards the goals I had set at the start of the lesson. No rigid plan, but attempting to bring their knowledge and understanding into line with what I intended.

**G Active, whole class teaching** The lesson was organised in the context of the whole class moving forward together, breaking into patterns of pair working and interacting as appropriate.

### **Nuffield Primary History project**

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