

# Mathematics and Slavery Teacher Notes

## WARNING

Throughout these lessons it is very easy to forget about slavery and talk about the maths. The slaves quickly become numbers in just another worksheet - the pupils need reminding constantly about the issues that arise.

It would be best if the pupils spent one lesson learning about the slave trade beforehand without using any mathematics. If there is a lesson that has been prepared as part of a History, English or Drama unit that would be ideal. It would also be good practice to link these lessons in to PHSE.

## Useful websites

[http://en.wikipedia.org/wiki/Slave\\_trade](http://en.wikipedia.org/wiki/Slave_trade)

A history of slavery from Ancient Greece to the present day

<http://www.pbs.org/wgbh/aia/part1/index.html>

A detailed history of the slavery of Africans

<http://www.spartacus.schoolnet.co.uk/USAslavery.htm>

An excellent source of information on all American slavery. Includes eyewitness accounts by slaves and others

<http://www.spartacus.schoolnet.co.uk/slavery.htm>

More from the excellent Spartacus site.

[http://www.chass.utoronto.ca/%7Enunn/empirical\\_slavery.pdf](http://www.chass.utoronto.ca/%7Enunn/empirical_slavery.pdf)

A serious paper that documents the extent of slavery and its influence on the economics of the participating countries

<http://www.sonofthesouth.net/slavery/index.html>

An account of Southern slavery with many good pictures and short readable articles

<http://beatl.barnard.columbia.edu/students/his3487/lembrich/seminar5.html>

Short accounts with striking artwork showing the suffering of slaves onboard the slave ships during the middle passage

<http://www.hullwebs.co.uk/content/j-georgians/people/william-wilberforce/slaveship-zong.htm>

An account of the slave ship Zong - an infamous case of murder that helped accelerate the abolition of the slave trade.

<http://www.eyewitnesstohistory.com/slaveship.htm>

An eyewitness account of the horrific conditions aboard a slave ship.

[http://en.wikipedia.org/wiki/Slave\\_ship](http://en.wikipedia.org/wiki/Slave_ship)

Slave ships

<http://www.homestead.com/gone2heaven/CapsJohnFacts.html>

Details of diet, conditions and mortality aboard a slave ship

<http://www.bristolandslavery.4t.com/index.htm>

An excellent site with clear pages that summarise information succinctly.

<http://www.nmm.ac.uk/freedom/viewTheme.cfm/theme/triangular>

A good description of the triangular trade including an interactive map.

<http://www.sonofthesouth.net/slavery/slave-maps/slave-census.htm>

The 1850 and 1860 census with commentary and analysis

<http://www.nationalgeographic.com/features/99/railroad/index.html>

An interactive version of the underground railroad suitable for use by pupils.

<http://mapmaker.rutgers.edu/page1projects.html>

A source of maps from which the underground railroad map is taken.

<http://school.discovery.com/schooladventures/slavery/witness.html>

A virtual slave auction

[http://www.historyonthenet.com/Slave\\_Trade/slave\\_auction.htm](http://www.historyonthenet.com/Slave_Trade/slave_auction.htm)

An account of slave auctions with free interactive quick quiz, word search and crossword.

[http://www.museumindocklands.org.uk/English/EventsExhibitions/Future/London\\_Sugar\\_and\\_Slavery.htm](http://www.museumindocklands.org.uk/English/EventsExhibitions/Future/London_Sugar_and_Slavery.htm)

The docklands Museum is about to open a permanent gallery featuring the slave trade.

<http://thescotsman.scotsman.com/uk.cfm?id=131432005>

An article from The Scotsman detailing the arrest and conviction of a modern day slave-master

<http://www.tradgames.org.uk/games/Mancala.htm>

Details of games similar to Wari

[http://en.wikipedia.org/wiki/Ota\\_Benga](http://en.wikipedia.org/wiki/Ota_Benga)

The imprisonment and exhibiting of Ota Benga

[http://www.simonsingh.net/The\\_Ishango\\_Bone.html](http://www.simonsingh.net/The_Ishango_Bone.html)

A brief description of the Ishango bone.

<http://www.understandingslavery.com/>

A substantial range of resources including videos for the dept of education and skills

<http://hitchcock.itc.virginia.edu/Slavery/index.php>

A gallery of hundreds of slavery images. They are free to educational users

# Lesson 1a - Slave Ships

## Preparation

Familiarise yourself with the conditions aboard slave ships. There are links on the CD - the best are shown below.

<http://www.eyewitnesstohistory.com/slaveship.htm>

[http://en.wikipedia.org/wiki/Slave\\_ship](http://en.wikipedia.org/wiki/Slave_ship)

<http://beatl.barnard.columbia.edu/students/his3487/lembrich/seminar5.html>.

## Aims

To use volume and density to analyse the appalling conditions aboard slave ships and to make pupils aware of the inhumanity of the slave trade

## Introduction

Use a digital projector to show these art images and text from the website:

<http://beatl.barnard.columbia.edu/students/his3487/lembrich/seminar5.html>.

State that you are going to use volume to measure the space available to store slaves and that we will use density to measure how close together the slaves were packed.

Remind pupils if necessary of how to calculate the volume of a cuboid.

## Main body of lesson

Distribute worksheets and help cards

Pupils work independently on the worksheet.

## Plenary

Ask pupils for their reactions to conditions on board. Ask about slave density and how it was calculated

If there is time, arrange some tables along the side of the room and pack the pupils underneath the tables in the same way as the eyewitness description.

## Homework/follow up

Complete questions 5-9, depending on how much is completed in the lesson. (Question 5 could be left out of the lesson and completed for homework)

# Lesson 1b - The Cost of Shipping

## Preparation

Familiarise yourself with the triangular trade and slave auctions by visiting these websites:

<http://www.nmm.ac.uk/freedom/viewTheme.cfm/theme/triangular>  
<http://www.bristolandslavery.4t.com/auctions.htm>

## Aims

To demonstrate that overcrowding ships was a way of increasing small profit margins.

To use number skills, including "percentage of a number" in a real context.

To interpret a balance sheet/historical document

## Introduction

Review the lessons on slave ships and link them with the sale of slaves in the last lesson. Ensure that pupils understand the balance sheet on the worksheet

## Main body of lesson

Distribute worksheets and help cards

Pupils work from worksheet

## Plenary

Ask how a percentage of a number is calculated.

Ask pupils to describe the methods they have used.

Ask about the profits the slave trader made on the slaves alone.

Remind them that profits would be increased by buying raw materials (sugar etc) in the Americas and selling them in Britain.

# Lesson 2a - Cargo Investigation

## Preparation

Familiarise yourself with the triangular trade and slave auctions by visiting these websites:

<http://www.nmm.ac.uk/freedom/viewTheme.cfm/theme/triangular>  
<http://www.bristolandslavery.4t.com/auctions.htm>

## Aims

To use proportion to calculate the amount of goods needed to be exchanged for a ship full of slaves. To emphasise the point that slaves were regarded as commodity and not humans.

## Introduction

Describe the typical journey of a slave ship from London to Africa, then America and then home again. Use the interactive map her:

<http://www.nmm.ac.uk/freedom/viewTheme.cfm/theme/triangular>

Give an example of a transaction based on the exchange rates shown on the worksheet. Stress that the pupils need to read the background notes as well as the exchange rates.

## Main body of lesson

Distribute worksheets and help cards  
Pupils work in threes on the cargo task

## Plenary

Ask for groups to feed back and comment on their solutions. Ask why guns, gunpowder (African traders to capture more slaves) and spirits (new luxury to the rich Africans who were selling the slaves) were sold.

# Lesson 2b - Profiting From Slavery

## Preparation

Familiarise yourself with the triangular trade and slave auctions by visiting these websites:

<http://www.nmm.ac.uk/freedom/viewTheme.cfm/theme/triangular>  
<http://www.bristolandslavery.4t.com/auctions.htm>

## Aims

To show how buying and selling slaves was profitable and again to show that slaves were a commodity. To apply percentage increase in a "real "context

## Introduction

Review the previous lesson on exchanging goods for slaves.  
State that this lesson is going to be about price and profit.  
Review (or present) percentage increase/profit.

## Main body of lesson

Distribute worksheets and help cards  
Pupils work from worksheet

## Plenary

Ask how percentage profit is calculated.  
Ask about the figures they have calculated.  
When was the most profit to be made?  
What influenced slave prices?

# Lesson 3a Slavery in America

## Preparation

Familiarise yourself with the underground railroad and refer to the census data to show how many slaves there were in America in 1850 and 1860

<http://www.sonofthesouth.net/slavery/slave-maps/slave-census.htm>  
<http://www.nationalgeographic.com/features/99/railroad/index.html>  
<http://www.pbs.org/wgbh/aia/part4/4p2944.html>

## Aims

To use percentages to illustrate the scale of slavery in the Southern states of America and

## Introduction

Use the plenary to illustrate the huge scale of slavery in America using the census data. For example there were more slaves than free persons in Mississippi. Revise the various percentage methods needed to analyse the figures. Stress that they will be extracting information from the front page of this lesson's material as well as the census and the previous lesson.

## Main body of lesson

Distribute worksheets and help cards

Pupils work independently on the worksheet.

\*Note that they will need information from the slave ship lesson

## Plenary

Ask for pupils to comment on the figures they have calculated

For example, the low rate of escape and the high rate of slave ownership in the southern staes (due to plantations of cotton, rice, and sugar

## Follow-up

Complete question 9 and stress that the pupils use all the figures in their argument banning slavery.

# African Civilisation

## Lesson 4a - Number Systems

### Preparation

Familiarise yourself with the Igbo number system and other number systems in Africa such as the Yoruba counting system,.

<http://www2.kumc.edu/itc/staff/rknight/Game2.htm>

<http://www.prenhall.com/divisions/esm/app/ph-elem/multicult/html/chap3.html>

<http://www.sf.airnet.ne.jp/ts/language/number/yoruba.html>

(This third website shows a slightly different version of Yoruba but is an excellent source of different counting systems from all over the world.)

### Aims

To use numbers to illustrate that pre-slavery Africans were intelligent human beings and not savages

### Introduction

Talk about our number system being based on tens but mention that other systems can be based on 5's (simple tally charts) and 20's (The French for eighty is quatre-vingt (4x20) and ninety is quatre-vingt dix (5x20 + 10)). Talk about Africa and the fact that there are over 800 languages spoken there now and that there are many different counting systems.

### Main body of lesson

Pupils decipher the Igbo number system and then go on to do the Yoruba system

### Plenary

Ask pupils to describe the Igbo/Yoruba system in their own words.

In fact, many Yoruba numbers do not follow the rules all of the time and some of their answers may be incorrect - there are many irregularities. (This is common in many languages - for example, eleven and twelve are not regular in English - in fact none of the "teens" are regular when compared to the later numbers.)



# Lesson 4b - The Riddles

## **Preparation**

Familiarise yourself with the riddles - make sure that you can solve them

## **Aims**

To solve problems and to annotate solutions

## **Introduction**

Give pupils 5 minutes to read the riddle. Take questions and ensure that they understand the notation. Ask them why the goat has to be the one to cross first.

## **Main body of lesson**

Pupils solve the riddles and record their solutions

## **Plenary**

Ask how pupils know when they have found the best solution

# Lesson 4c - Wari Tournament

## **Preparation**

Ensure that you know the rules of Wari

<http://www2.kumc.edu/itc/staff/rknight/Game2.htm>

## **Equipment**

Counters (24 per pupil) and Wari boards

## **Aims**

To learn a game of strategy and develop winning strategies and reflect on them.

## **Introduction**

Go through the game - demonstrate moves on a OHP or with the Wari word file by moving the counters with the cursor.

## **Main body of lesson**

Pupils learn and play Wari

## **Plenary**

Ask pupils to describe winning strategies. Ask pupils whether this is complex game or one that a group of savages could devise.