

**Y Ganolfan Eifftaidd**  
Amgueddfa henebau'r Aifft  
Prifysgol Abertawe Parc Singleton,  
Abertawe, SA2 8PP



**The Egypt Centre**  
Museum of Egyptian Antiquities  
Swansea University, Singleton Park,  
Swansea, SA2 8PP

01792 295960

Dear

Thank you for booking your school party at the Egypt Centre. Please find enclosed the **Teacher's Maths activity pack**.

The Teacher's pack contains sheets, which involve 'hands on' activities (such as making a 'mummy'); these are a reminder of the day. Other sheets involve observing certain objects and recording answers. The students will not be expected to work unaided but take part in the activities with the Egypt Centre's assistants. Most of our staff who will be working with your school are unpaid volunteers and not trained teachers. Please could you therefore ensure that the students are supervised at all times.

We charge £2 a head for each child and provide the relevant photocopied sheets, clipboards and pencils for the children to use. If any students do not turn up we charge 50p for the photocopied work pack, which you take away with you. Teachers and students may bring cameras but **we do not allow flash photography** in the museum galleries, due to conservation issues regarding safe light levels. We also have a shop area with 'Egyptian' themed items for sale starting from 30p and offer a 'goody bag' service. Please make cheques payable to *Swansea University*.

We look forward to seeing you and hope you enjoy your time at the Egypt Centre. Any comments on how we can improve our services to you will be gratefully received.

Yours sincerely,

Wendy Goodridge  
*Assistant Curator*

# Important Notice for Teachers

We want to ensure that your visit to the Egypt Centre is happy, safe and rewarding. In order to achieve this we want to explain our roles; what you can expect from us and what we expect from you.

## *The Role of the Egypt Centre*

- All activities are museum led. We will provide trained activity leaders to work with small groups of children. Activity leaders are **not** expected to discipline children. All staff working with your children are fully-enhanced CRB checked.
- We will endeavour to provide as many of the activities chosen by the school in the time available.
- We will provide all materials and equipment needed for each activity, which are safe to use.
- We will provide each child with a clipboard, pencil and work-pack for their use during the visit.
- If required, we can provide a safe area for lunch near toilet facilities.
- We provide a gift-shop that caters for school children and is relevant to areas of study.
- We welcome feedback from schools and each school is given a questionnaire to return.

## *The Role of the School*

- The school should try to arrive at the agreed time.
- The school will pay a £2 for each child and 50p for any work packs not used due to absence of children.  
(Please make cheques payable to *Swansea University*)
- A member of school staff should supervise each group of children at all times and ensure good behaviour.
- Ensure the equipment and materials that are to be used for subsequent school groups and the public are not being misused.
- Respect other visitors to the museum.
- If the school has any concern please report it to a member of staff.

The Egypt Centre wants to ensure that children are protected from harm while in the Museum. In addition to the Museum's responsibilities, we ask that teachers/leaders of groups exercise their own responsibilities.

In particular, all leaders/teachers shall:

- Make sure they have adequate staff supervision using the ratios laid down by their institution. This is a suggestion:
  - 0-2 years = 1 adult to 3 children
  - 2-3 years = 1 adult to 4 children
  - 3-7 years = 1 adult to 8 children
  - 7 years + = 2 adults (preferably one of each gender) for up to 20 children/young people, and one additional staff member for every additional 10 children/young people.
  
- Ensure they supervise the children/young people at all times
- In case of an accident, contact a member of the Museum staff who will follow the Museum procedures
- In the case of a lost child, contact a member of the Museum staff who will follow the Museum procedures
- Refrain from having possession of, or consuming, alcoholic beverages on the Museum premises
- Refrain from either verbally or physically abusing a child/young person
- Ensure adequate insurance cover for the group and leaders
- Ensure that the appropriate group leaders carry any necessary medicine for the children with them at all times, with the permission of the parents/guardian
- Inform their group of behavioural expectations while in the Egypt Centre

The Museum hopes each visitor has an enjoyable and exciting visit. We therefore expect all visitors to display courtesy and respect for others, and for the Museum property, at all times while visiting the Museum.

Group leaders should therefore not allow members of their group to:

- make any sectarian, racist, sexist or other offensive remarks toward any person or other group
- vandalise Museum property
- leave litter in the Museum/University grounds.

# **The Egypt Centre *Hierogift* Shop**

## **‘GOODIE’ BAGS FACILITY**

The museum shop is available for use by all visiting parties during their time at the centre. There are many items geared towards school children, and at a very affordable price (items start from 25p!). There should be (time permitting) a chance for your group to visit the shop at some time during the day.

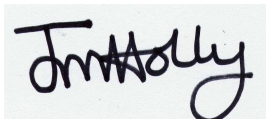
However, the shop is quite small, so we are unable to serve a whole group at the same time. It is recommended that groups use the shop 6 or 7 at a time in order to make it easier for the shop assistants and for the children themselves.

We also offer to make up ‘goodie bags’ which can be prepared in advance, up to a certain amount of money, ie. £1.50, £2.00, £3.00 etc. This can make the visit easier for schools especially if they are pressed for time.

If you wish to use this facility, please contact me in advance and I can have a selection of items for you to see during the morning session. I can suggest items to put in the bags, both educational and fun. Some examples include; blank papyrus, painted papyrus, bookmarks, pencils, pens, scarab beetles and small statues, necklaces and rings. The bags will be ready before you leave.

If there are any other questions about the shop you wish to ask, then please do not hesitate to contact me here at the Museum.

Many thanks

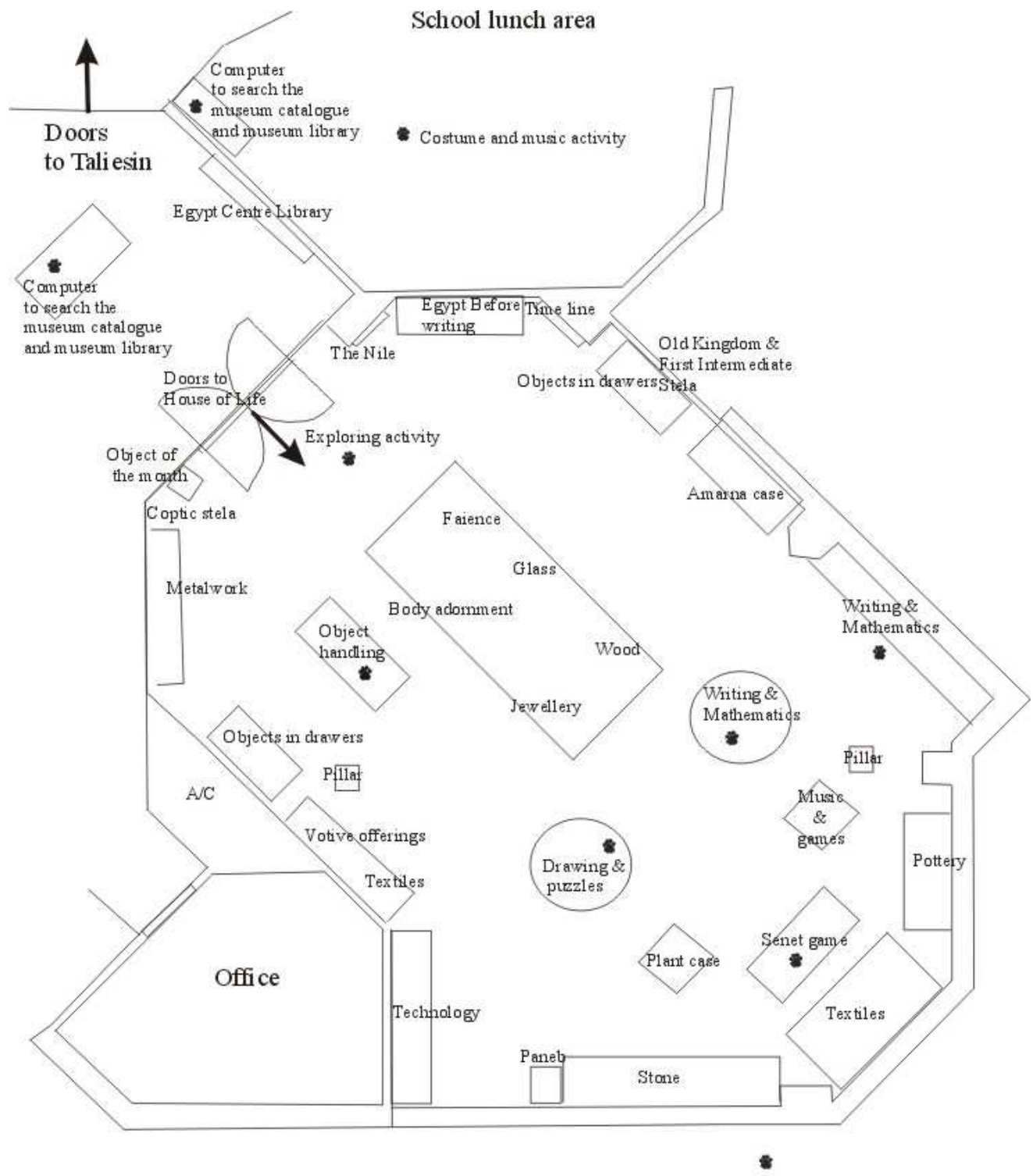
A handwritten signature in black ink on a light grey background. The signature reads "Jayne Holly" in a cursive, slightly stylized font.

Jayne Holly


**Museum Assistant (Gift Shop manager)**

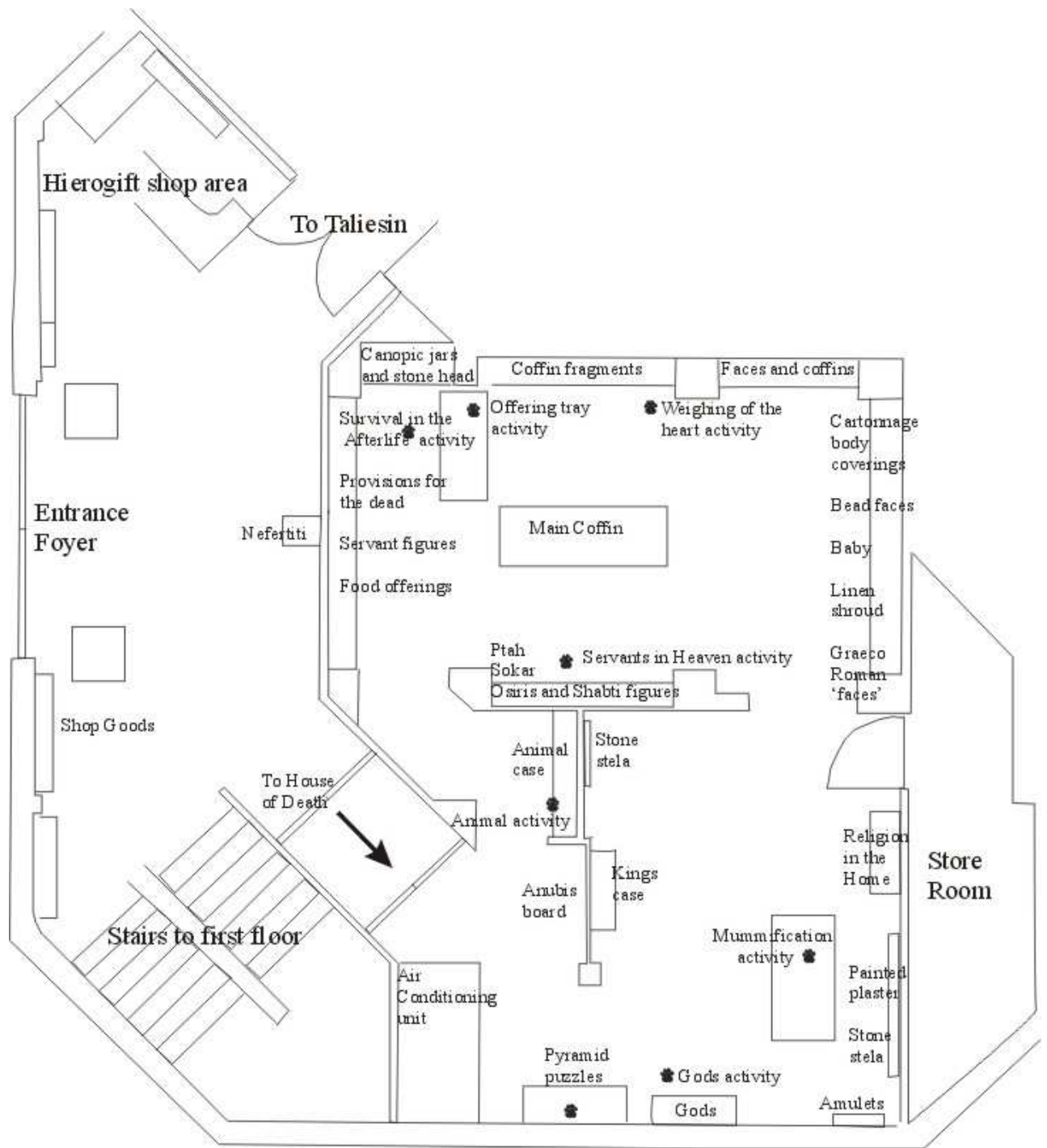
Tel: 01792 295960

E-mail [j.m.holly@swansea.ac.uk](mailto:j.m.holly@swansea.ac.uk)




## Egypt Centre First floor plan

 Hands-on activities



## Egypt Centre Ground floor plan

 Hands-on activities

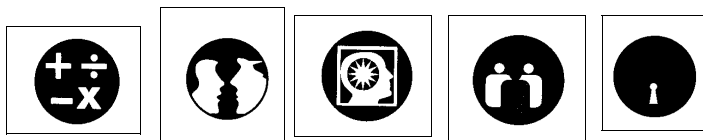
When you arrive at the museum your school is welcomed and the students are handed their clipboards, sheets and pencils and divided into two groups. One group will go into the *House of Death* and one group will go into the *House of Life*. The students go for lunch in a pre-booked area and after lunch swap over so they all have an opportunity to see both galleries.

In the *House of Life* the activities we will try and cover, depending on time constraints, are:

### 1. Maths and Measuring

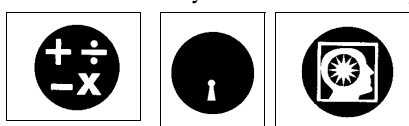
Students will examine the measuring units used by the ancient Egyptians and decide which ones to apply in order to measure various objects. They will compare ancient measuring units with modern measuring units and recognise the imperfections of the ancient units.

Students will look at the way numbers were written in ancient Egypt and complete simple and more complicated calculations using this system. Connections between addition and subtraction as well as multiplication and division are made.



### 2. Mirror Images, Reflection and Symmetrical hieroglyphs

Students are encouraged to look at symmetrical shapes and patterns and also to observe symmetrical shapes in the *House of Death*.



### 3. Senet game

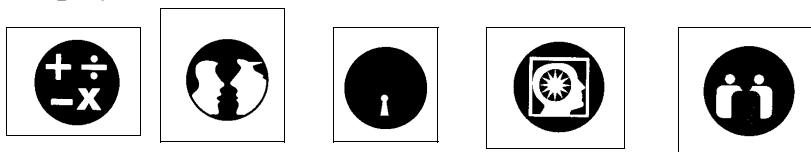
Students are placed in teams to play the ancient board game *senet*. They learn about ancient Egyptian beliefs and develop strategy and team building skills. We have a replica of a *senet* board found in Tutankhamun's tomb with throw sticks instead of traditional dice.



In the *House of Death* the activities we will try and cover, depending on time constraints, are:

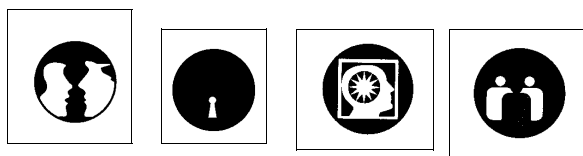
### 1. Mummification and Opening of the Mouth Ceremony

Using a model the students learn the art of deluxe mummification! This includes the removal of organs from the body, drying the body, bandaging the body and the ceremony and ritual that was an integral part of the mummification process. Students are encouraged to participate in role-play and use the props provided. Students are encouraged to question whether or not the ancient Egyptian amulets (and other objects) found in the mummy wrappings to protect the dead person should have been taken and displayed in museums around the world!



### 2. Pyramid Puzzles and Maths for Mummifiers!

Students are encouraged to explore number patterns, make predictions and develop mathematical strategies to overcome difficulties.







# Egypt Centre School Party

## Mathematics

Name.....

School.....

A number of objects in the Egypt Centre are dated by Egyptological period rather than chronological dates. Egyptologists do differ in the detail of how these periods relate to actual years. Below is a generally accepted chronology based on that used in recent British Museum publications.

- Predynastic Period 5500-3100BC
- Early Dynastic Period 3100-2686BC
- Old Kingdom 2686-2181BC
- First Intermediate Period 2181-2055BC
- Middle Kingdom 2055-1650BC
- Second Intermediate Period 1650-1550BC
- New Kingdom 1550-1069BC
- Third Intermediate Period 1069-747 BC
- Late Period 747-332 BC
- Ptolemaic Period 332-32 BC
- Roman Period 30BC-AD395

# The Egyptian year

Due to observations of the Nile and the moon the Egyptian year was divided into 12 months and 3 seasons.

*Akhet* was the season when the Nile flooded (inundation of the Nile).

*Peret* was the spring season when the crops started to emerge.

*Shemu* was the harvest season.

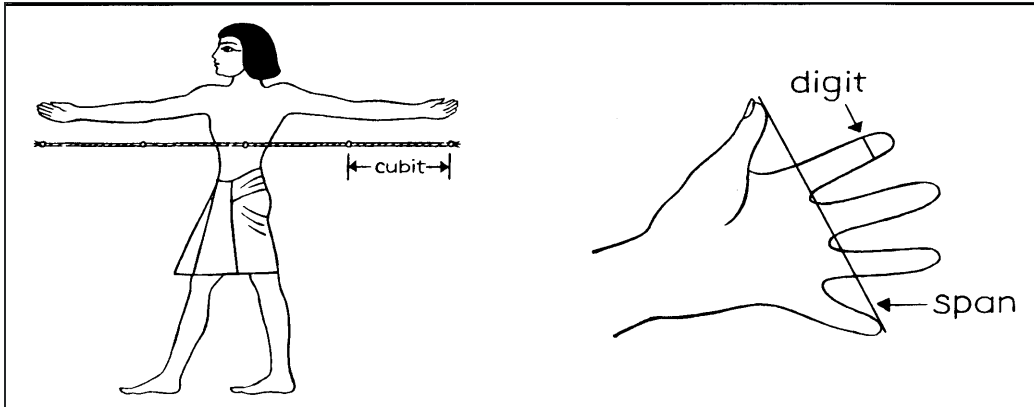
Each season consisted of 4 months of 30 days totalling 360 days.

5 days celebrating the birthdays of major Gods and Goddesses were added making 365 days.

The Egyptians were the first to divide day and night into 12 hours each.

Time was measured by observing the position of the sun and the stars. They also used water clocks. A water clock is a water-filled vessel with a hole in the base through which the water gradually drained away. During the day time could be measured using a sun-dial. A vertical pole was pushed into the sand and the position of the shadow cast by the sun was noted.

# MEASURING

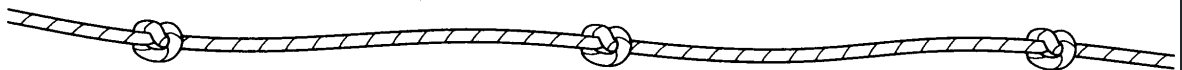


4 digits = 1 palm. 7 palms(or 28 digits) = 1 cubit.

Work in pairs using these units to measure the following:  
Decide which is the best unit to use.

Object	Units used	Person A	Person B
Paper length			
Shabti length			
Palette width			
Offering table height			
Room length			
Door height			
Pencil length			
Lintel length			
Your favourite object			
Your teacher's height			

What problems have you discovered about their units of measure?  
What standard units do we use today?



Everyone in Ancient Egypt agreed on the length of a cubit.  
They used a knotted rope to measure distances in cubits.

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# EGYPTIAN MATHEMATICS



We are going to look at the way the Ancient Egyptians wrote numbers using hieroglyphs over 4,000 years ago.



1

*These are the units 2 is || 3 is |||*

**Can you write the number 6 in the box**



10

*This is a Cattle Hobble*

**Write the number 30 in the box**



100

*This is a Piece of Rope*

**Write the number 400 in the box**



1,000

*This is a Lotus Flower*

**Write the number 2000 in the box**



10,000

*This is a Finger*

**Write the number 30,000 in the box**



100,000

*This is a Tadpole*

**Write the number 200,000 in the box**



1  
Million

*This is a God, holding up the sky*

**Write the number 1 million in the box**

**Using Egyptian numbers can you write  
your age in this box**

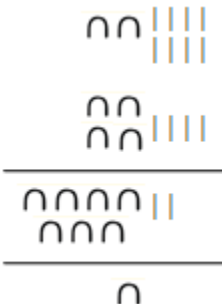
The number of your house?


The number of days in the year (365)

This year

The number of students at Swansea University (14,000)

Here are some examples of Egyptian sums

$\begin{array}{r} 28 \\ 44 + \\ \hline \end{array}$		<p>Add the units first These make 12</p> <p>which is <math>n \parallel</math> down, carry <math>n</math></p>
---	---	--

$\begin{array}{r} 42 \\ 21 - \\ \hline \end{array}$	
---	---



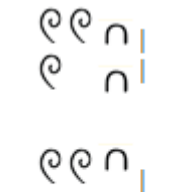

Now it is your turn to try

$\begin{array}{r} 13 \\ 8 + \\ \hline \end{array}$	
--	--

$\begin{array}{r} 34 \\ 42 + \\ \hline \end{array}$	
---	--

$\begin{array}{r} 49 \\ 18 - \\ \hline \end{array}$	
---	--

Finally, can you do these Egyptian sums?

	-		+		-		+

We are now going to find and count some objects in the gallery.  
Remember to write your answers in Egyptian!

1 Look in the metal-work case, how many axes are there?

2 How many arrow-heads can you find?

3 Look in the faience case, how many shabtis can you find?

4 Look in the Amarna case, how many collars can you find?

5 How many head-rests can you find?

6 Look in the jewellery case, how many necklaces can you find?

7 How many marbles can you see in the games case?

# Egyptian Multiplication

The ancient Egyptians only needed to learn their 2 times table because all multiplication was done by 'DOUBLING'.

For Example:  $32 \times 9$

$32 \times 1$	$\Rightarrow$	
<del><math>32 \times 2</math></del>	<del><math>\Rightarrow</math> </del>	then double this
<del><math>32 \times 4</math></del>	<del><math>\Rightarrow</math> </del>	then double this
$32 \times 8$	$\Rightarrow$	
$32 \times 9$	$\Rightarrow$	
	$\Rightarrow$	Since 1 plus 8 equals 9 cross the others off

Try multiplying  $21 \times 7$

$21 \times 1$

$21 \times 2$

$21 \times 4$

As 1 plus 2 plus 4 equals 7 there is no need to cross any off!



# Egyptian Division

Division is closely linked to multiplication. If the ancient Egyptians wanted to divide they would use the same system of 'DOUBLING' that they use for multiplication.

Example: To divide 108 by 9 they would start with 9 and double it until they reached 108.

<del>9 x 1</del>	<del> <table style="margin: 0 auto; border-collapse: collapse;"> <tr><td style="padding: 0 5px;"> </td><td style="padding: 0 5px;"> </td><td style="padding: 0 5px;"> </td></tr> <tr><td style="padding: 0 5px;"> </td><td style="padding: 0 5px;"> </td><td style="padding: 0 5px;"> </td></tr> <tr><td style="padding: 0 5px;"> </td><td style="padding: 0 5px;"> </td><td style="padding: 0 5px;"> </td></tr> </table> </del>										<del>→ 9</del>			
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∩	∩	∩												
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9 x 12	→	108												

Since 72 and 36 equals 108 cross the others out  
4 plus 8 equals 12 therefore 108 divide by 9 is 12

Using the system of doubling divide 35 by 5

5 x 1

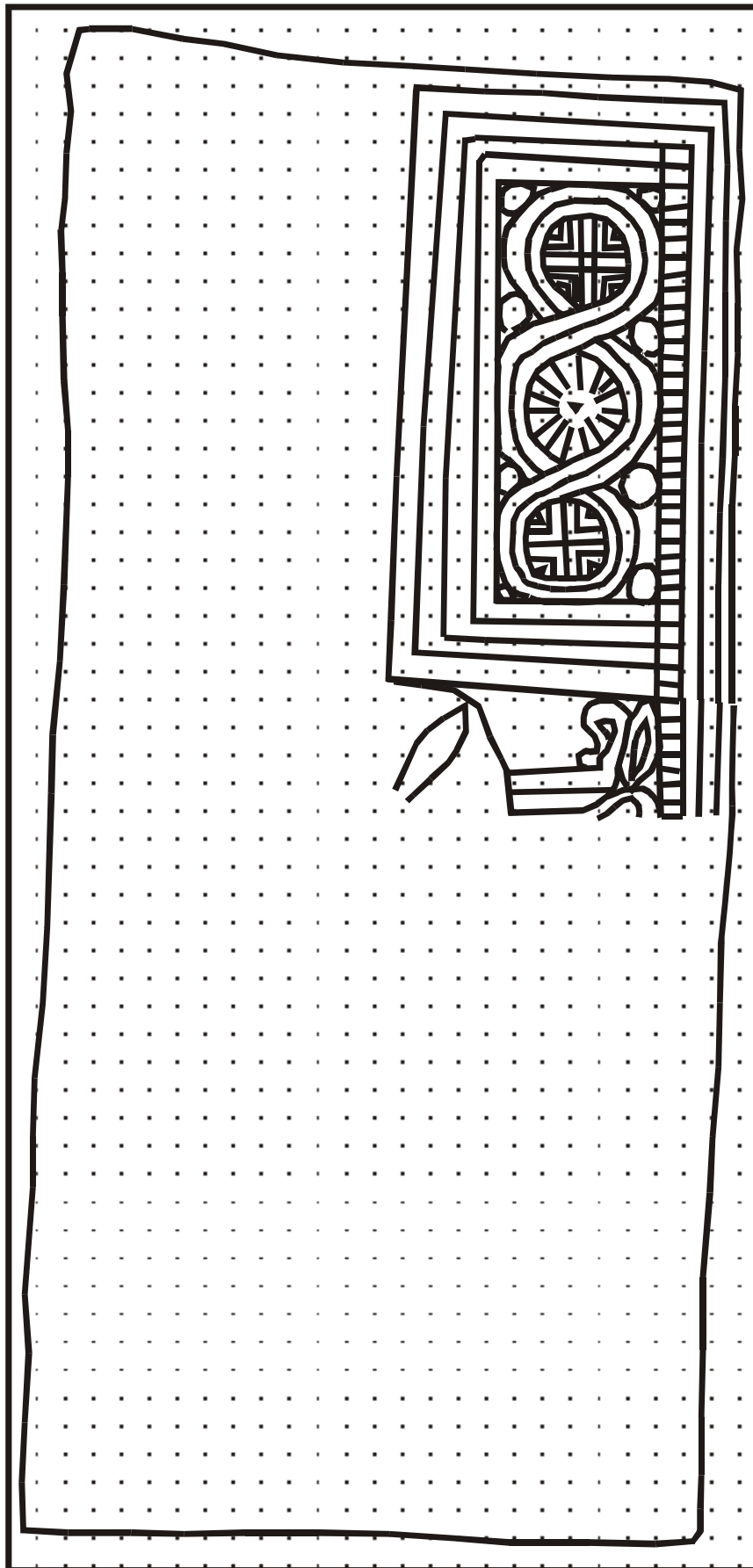
5 x 2

5 x 4

Write the answer in Egyptian form

# Mirror Images and Reflection

Complete the drawing of the Coptic stela

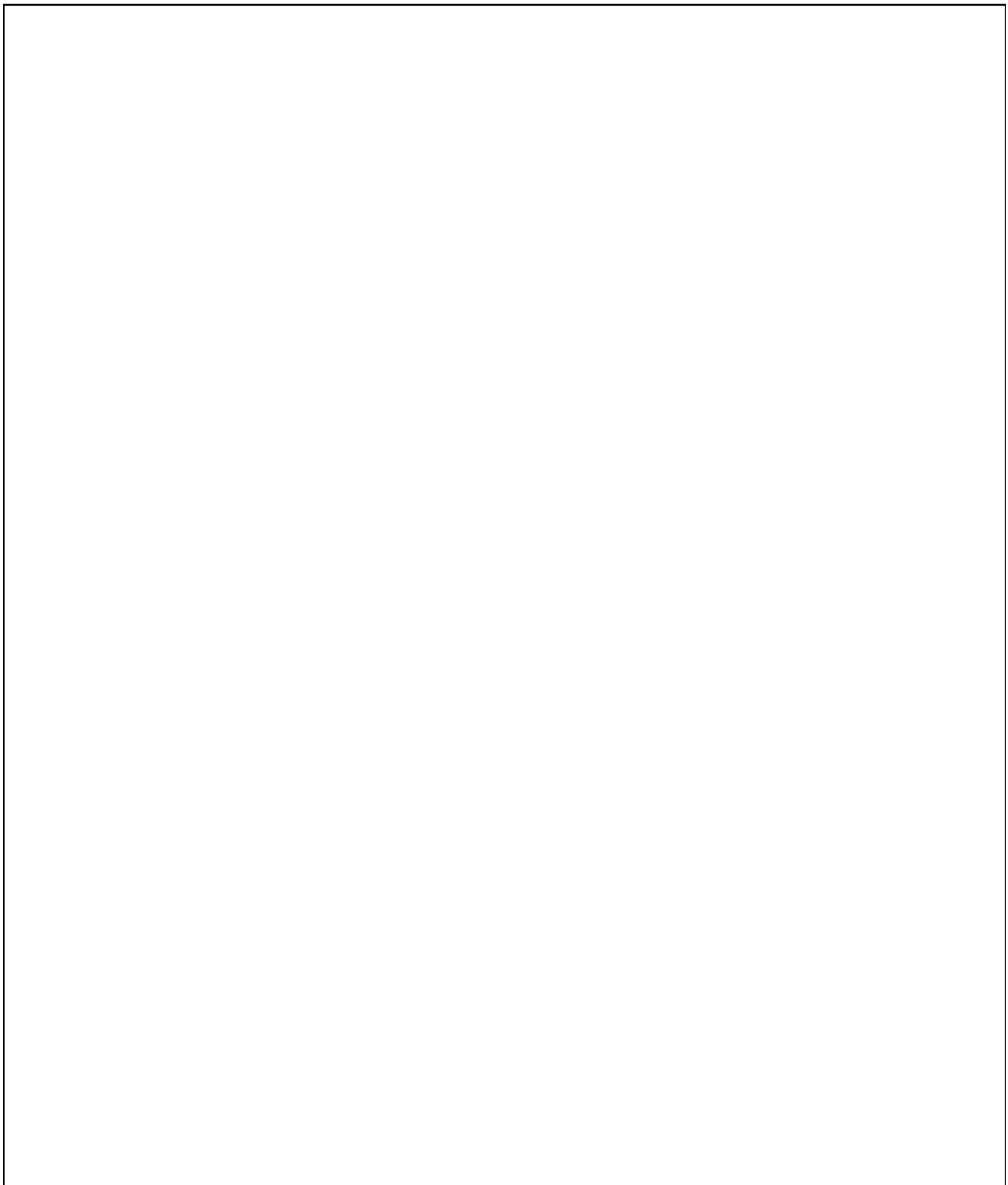


# Egyptian Symmetry

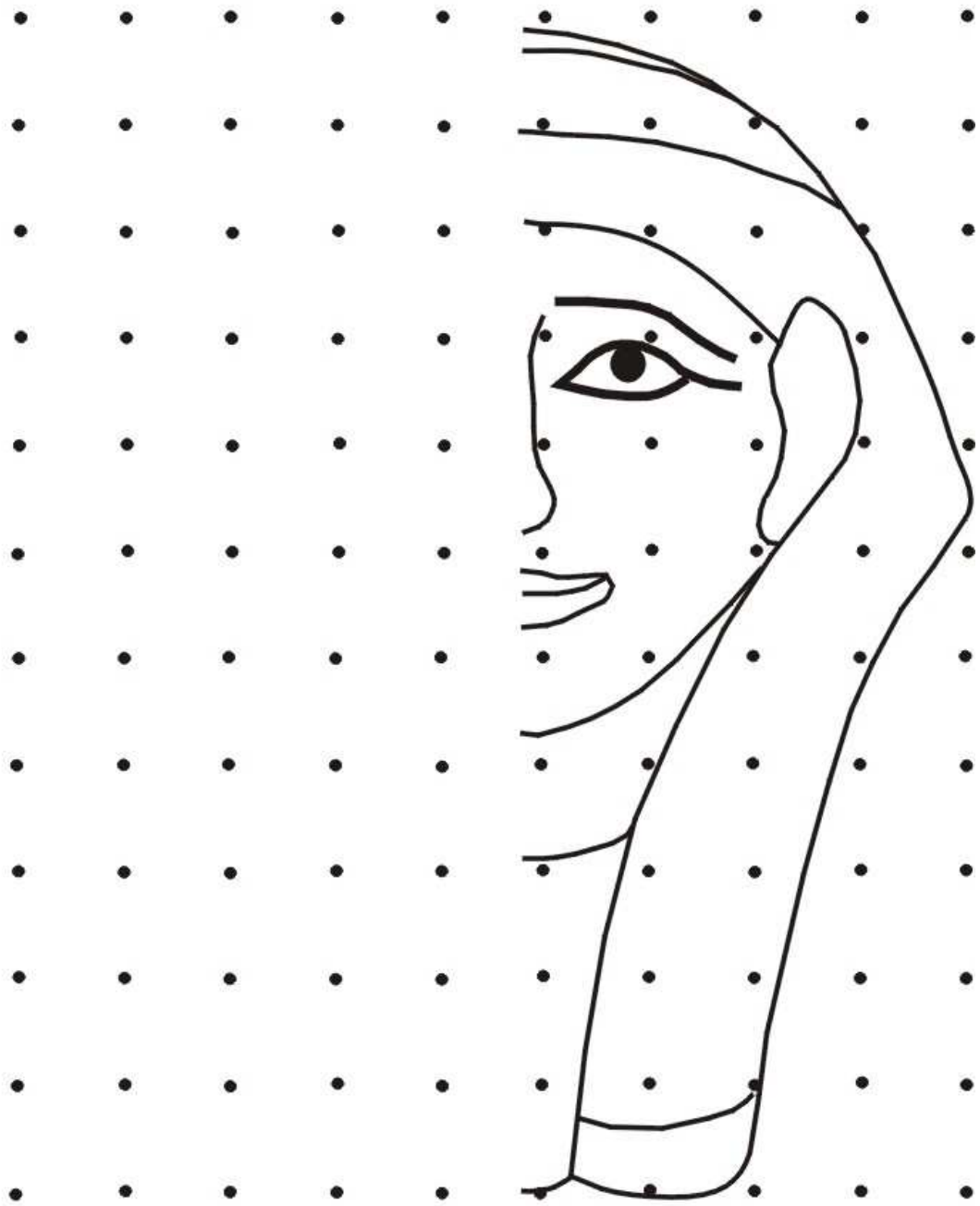
Look around the *House of Death* can you list 5 different objects that are symmetrical?

- 1.
- 2.
- 3.
- 4.
- 5.

Draw one of them:



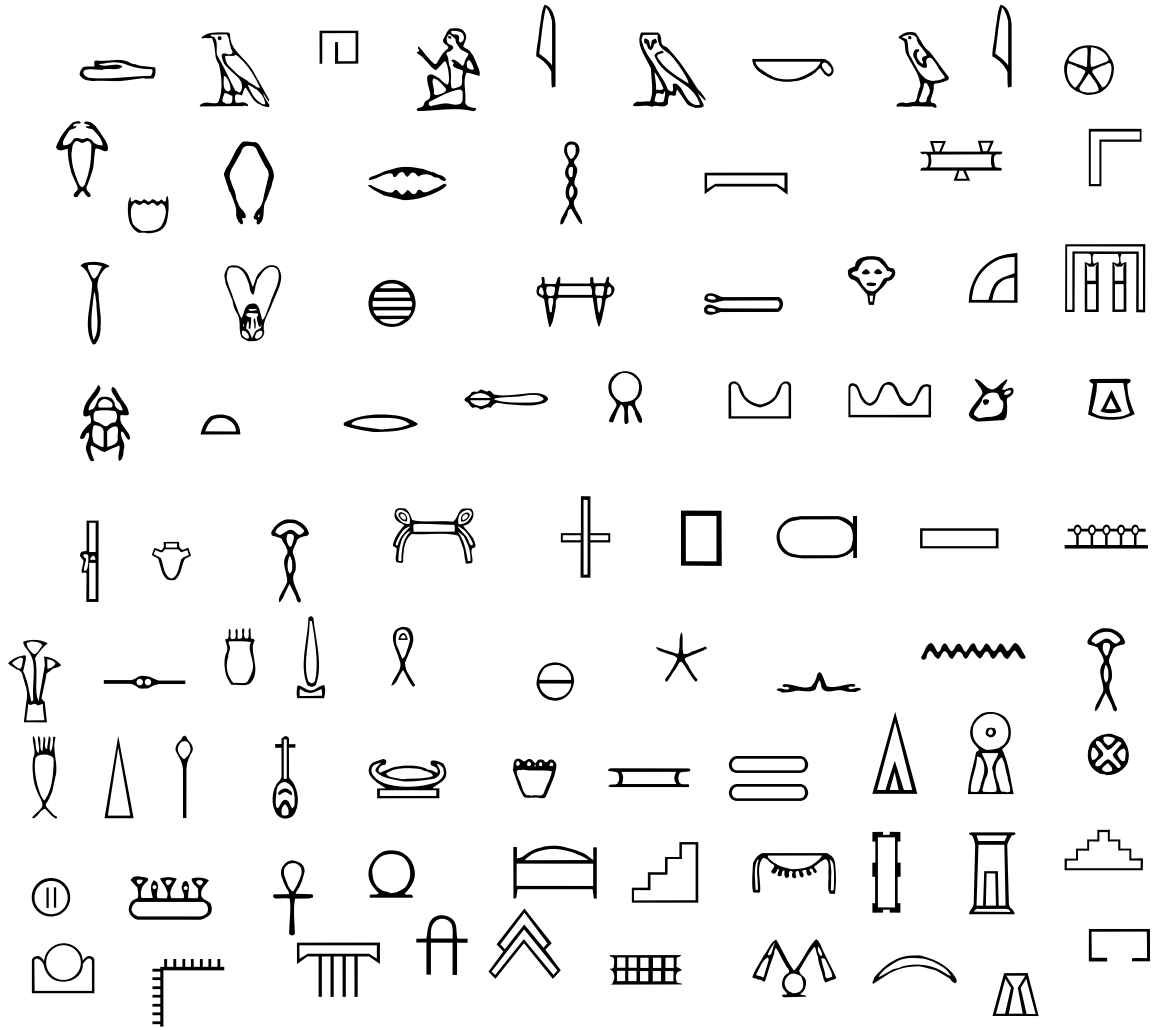
# Egyptian Symmetry



Use the dots to help you draw the other half and colour the picture like the gold mask on display

# Symmetrical Hieroglyphs

Look at the hieroglyph shapes to see how many lines of symmetry you can



find and draw the symmetry lines on each shape. Mark your answers in the boxes below.

Horizontal	Vertical	Diagonal	2 or more	None

## Senet (The Passing Game)

The game dates from the 4<sup>th</sup> millennium BC to the 3<sup>rd</sup> century AD. It died out, like much of ancient Egyptian culture, with the Christian era. The earliest known examples of senet boards come from 1<sup>st</sup> Dynasty tombs at Abu Rawasch though it probably dates to the Predynastic times.

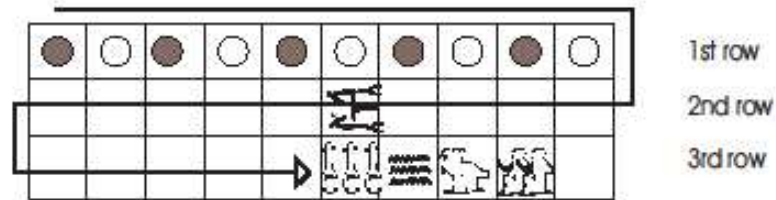
There are over 120 games known in museums throughout the world.

Senet may well have been a game played in everyday life, for fun. However, it also seems to have had a religious meaning, regarding funerals and Hathoric rites connected with funerals. Often games of senet were placed in tombs. Tutankhamun, for example had 4 games in the tomb with him.

# Senet

We do not know exactly how senet was played. This is a possible way.

Starting position  
with direction  
of play.



Throw the die to move. Each roll of the die moves only one piece. The aim is to be the first player to play all her/his pieces off the 3rd row.

Before any player can play a piece off the board all players must be off the 1st row.

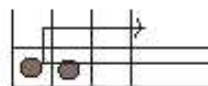
A player can 'capture' an opponent's piece by landing on it. In this case the captured piece is placed on where the 'victor' started.

A throw of '2' or '3' ends a player's turn and is the last move for that turn.

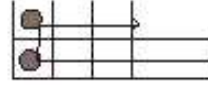
Strategy: A throw of '2' may be useful to protect pieces (see A below), a throw of '3' to advance a 'wall' (see B below).

A. Protected Pieces: Two pieces of the same colour in the line are deemed to protect each other and neither can be 'captured'

Examples:



direction  
of play



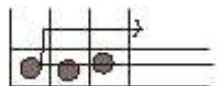
direction  
of play

B. Normally pieces can jump over each other, but not if you build a 'wall'.

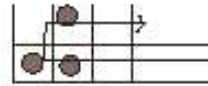
A Wall: Three pieces of the same colour in a line are a 'wall'.

In this situation opponents pieces cannot pass until the wall is disbanded. If a player has no piece that can move forward he or she must move a piece backwards.

Examples:



direction  
of play





direction  
of play

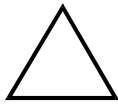
'Protected Squares': Any piece on one of these squares cannot be captured.

Strategy: It is good to leave pieces here as long as you can, and you can use them as safe areas to start to build a wall on.

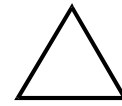
Protected Squares



'Water Trap': If a player has only one piece that can be moved and that piece lands on this square  that piece goes back to the  Square. If this place is occupied the 'water trapped' piece goes back to the first available square on the row.



# Pyramid Puzzles



The pyramids were built with a square base with the apex directly above the centre of the base.

Using multi-link blocks make a pyramid with a base of 9 blocks square.

How many blocks high is it?.....

How many blocks did you use?.....

If you wanted to build your pyramid 10 blocks high how many blocks would you need?.....

Round this number to the nearest 100.....

If your bottom layer contains 121 blocks how many blocks high would your pyramid be?.....

How many blocks altogether?.....

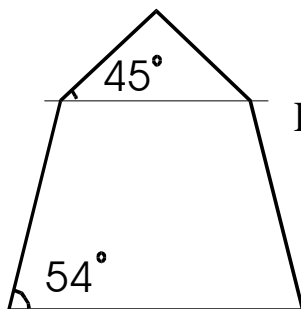
Round this to the nearest 10.....

Round this to the nearest 100.....

If 3 pyramids have a total of 1467 blocks how many blocks are needed to build 5 pyramids?.....

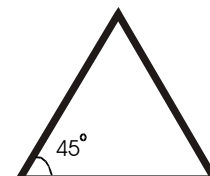
Round answer to nearest 1000.....

Look at a picture of Snofru's 'bent pyramid.' Why do you think it was made like this?



Draw a pyramid like this back at school starting with an angle of  $54^\circ$  then change the angle to  $43^\circ$  near the top.

If you wanted to make this pyramid taller on the same size base what would you do?





## A 'Brief Guide' to Mummification.

Most people were buried in pit graves in the hot dry sand and this mummified the body naturally. However, as building techniques improved the wealthy had larger tombs built to house the many grave goods that they wanted to use in the Afterlife. This posed a problem as damp crept in and caused the body to rot quickly and so the mummification process developed. The process described here is the 'deluxe' method that only the wealthy could afford and would have taken 70 days to complete.

- Soon after death the body of the deceased was brought to the mummification tent, *per-nefer*, which means "the beautiful house" or the place of mummification.

### **Q. Why do you think mummification was performed in a tent?** (Answer ON NEXT PAGE!)

- The embalmers washed the body with sacred water, which was taken from a sacred local lake.
- First the brain was removed. A chisel was passed up a nostril and through the ethmoid bone into the cranial cavity, and using a spatula the brain was cut into small pieces. A hooked rod was inserted, and turned to make the brain liquefy in order to extract the brain through the nostrils. After that, they cleaned the skull cavity with palm wine, stuffed it with linen and poured resinous liquid into the skull. The Egyptians didn't know what the brain was, they just threw it away!
- Next an incision was made, using a sharp piece of flint, on the left side of the abdomen and the internal organs, except the heart, were removed. The thoracic and abdominal cavities were cleaned and rinsed with palm-wine, gum-resin and vegetable matter and then treated with natron and ointment.
- Each organ was soaked in natron for 40 days before being bandaged and placed in one of four canopic jars. These take the form of the Four Sons of Horus and each one protects a particular organ:

INTESTINES – Placed under the protection of Qebhsenuf (hawk headed jar).

STOMACH – Placed under the protection of Duamutef (jackal headed jar).

LUNGS – Placed under the protection of Hapy (baboon headed jar).

LIVER – Placed under the protection of Imset (human headed jar).

- The cavities are then 'stuffed' with linen parcels of natron, to speed up the drying process and sawdust to absorb liquids.
- The final stage in the embalming process was the treatment of the whole body with natron for 40 days. Natron is a naturally occurring substance found in the ground in Egypt. It's a bit like salt and bicarbonate of soda. This would help to dry any fluids that are lying on the body.
- The temporary stuffing packages and the natron dried the body, and were changed regularly by the embalmers. After the 40 days, the body was taken out of the natron and the temporary stuffing packages were removed from the thoracic and abdominal cavities. The chest and abdominal cavity were washed with palm wine and re-stuffed with fresh dry materials; these included aromatically

perfumed cloth packing, Nile mud, myrrh, cassia, linen, resin, saw dust and one or two onions.

- The incision was stitched closed with linen string and the body was anointed with cedar oil. The mouth, ears, and the nose were sealed with bee's wax or linen in molten resin, which may have also played some part in preventing or delaying insect attack and in masking the odours of decomposition that would have accompanied the mummification process.
- The body was then wrapped with linen. The aim of the wrapping was to preserve the mummy. Binding was used to keep the wrapping tight and in place. The wrapping process, starting with the fingers and toes, and then the rest of the body, would take 15 days.
- As the embalmers were wrapping the body they would sew amulets, protective magical charms, into the bandages. An amulet or charm was worn to give the wearer protection or power. Different amulets were connected with different powers. The living wore amulets to give magical power or protection and the dead wore amulets wrapped up in their mummification bandages or laid on the outer surface to protect and aid them on the journey to the afterlife. Sometimes amulets were drawn on the bandages themselves, which in turn became protective amulets. Amulets occur as early as Pre-dynastic times (c5500 BC) and were made of many different types of materials such as stone, metal, glass, or more commonly, faience. The materials were chosen for their supposedly magical properties and where a particular amulet is placed on the body was important.

(Answer : The tent would protect the body from the heat, and allow air to pass through; taking away the bad odours that would accumulate.)

# Maths for Mummifiers!

A baby crocodile is 12cm long and if the daddy crocodile is 3 times longer how long is the daddy crocodile?.....

The chief embalmer charges 3 bags of onions for a baby crocodile and 5 bags of onions for an adult crocodile. If he has an order to mummify 2 baby crocodiles and 1 adult crocodile how many onions did he earn?.....



Look at the mummified crocodile in the Animal case. Imagine the crocodile is approximately 75cm long and is 45cm wide at its widest part. You are the chief embalmer and you need to get bandage ready for mummification. You want to wrap the crocodile with at least 7 layers of bandage and the bandage you are using is 5cm wide. What do you estimate is the maximum amount of bandage you need?

Round this to the nearest thousand.....

The chief embalmer used 1325 cubits of bandage to wrap the toes and fingers of a mummy and it took him 2 and a half days.

How much bandage did he use on the second day?

Round this to the nearest hundred.....