Historical Association
The voice for history

HA Annual Conference
12 & 13 May 2017
Mercure Manchester Piccadilly Hotel

NUMBER, SHAPE AND THEORY IN THE HISTORIC WORLD

Karin Doull

University of Roehampton

Sponsored by AQA Pearson

Fieldwork and Investigation

THE HISTORIC ENVIRONMENT

Investigating Historic Sites

- **Focus on the History !**
  - What does this place tell us about:
    - the time
    - how people lived
    - why they created this place
- **Use fieldwork techniques**
  - Sketch maps
  - Marked Plans
  - Photos
- **Deploy mathematical skills**
  - Number
  - Measurement
  - Shape and Space



Butser Ancient Farm

- http://www.butserancientfarm.co.uk/planning-your-visit/



- Experimental archaeology site
- Reconstructed settlements across early British History
  - Neolithic
  - Iron Age
  - Roman
  - Saxon
- Field Trials
- Ancient breeds
- Archaeology

Roundhouse

- Size of posts and number of posts (N) (M)
  - (link to size of house)
- Effective range of fire (M)
- Construction of roof
  - Number of struts (N)
  - Shape of strengthening **(G)**
- Angle of roof **(G)**
- Area of living space **(G)**
- Number of people using space ~ ratio of people to area. **(G)**



Farm



http://www.butserancientfarm.co.uk/about/

- Wattle and Daub
  - Optimum distance between staves and lengths of sticks for weaving **(M)**
  - Amount of daub per length of wattle **(M)**
  - Lifetime of wattle fences
- Use of fields and strip farming ~ recording use and rotation **(S)**

Roman Villa and Saxon Longhouse

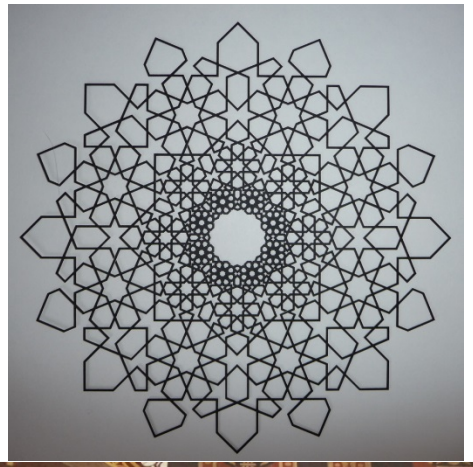
- Identify and record shapes within building **(G)**
- Construction of roof **(G)**
  - Shapes
  - Angle
- Effectiveness of heat source (M)
- Use of hypocaust (M)
- Number of windows (N)
  - Numbered windows
- Use of space **(G)**
  - Ratio of people to area
- Create detailed scale plan of building
- Create detailed scale model of building (M) **(G)**



Use of pattern within architecture and household goods

DECORATIVE ARTS

Pattern and Perfection





- Use of shape within interior decoration **(G)**
  - Islamic mosques
    - Girih Tiles used to create Islamic geometric patterns
    - Decagon, elongated hexagon, bowtie, rhombus, regular pentagon
  - Churches/ Cathedrals/Houses of Parliament
    - Pugin and Minton
    - Fleur de lis, roses, plant shapes

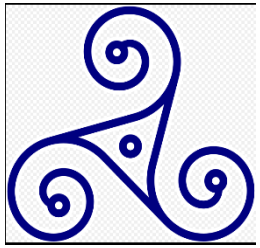
http://www.craftsmanspace.com/free-patterns

Decorative objects

- Symmetry and Tessellation
  - Shang Dynasty
    - Taotie
  - Ancient Greece
    - Meander and waves
  - Celtic Art
    - Triskelion



http://www.instantdisplay.co.uk/taotiemasks.pdf





http://gwydir.demon.co.uk/jo/greekkey/keys.htm

https://en.wikipedia.org/wiki/Triskelion#/media/File:Triskel_type_Amfreville.svg

BOARD GAMES

Creative Outcomes

- Use as the outcome of an historical investigation to demonstrate understanding of key themes
- Group or pairs activity
- Must have:
  - Board with hazards and rewards
  - Counters for players
  - Some mechanism to move players (Die/Spinner)
  - Rules to play

SIGNIFICANT INDIVIDUALS

Mathematicians who rules the world

- KS 1 ~ Significant individuals
  - How did they represent their period?
  - How did affect understanding either then or later?
  - How might these individuals be linked?
- KS2 ~ Theme across British History
  - Select across specific periods to investigate thinking in relation to that time
  - What do the problems they investigated tell us about that time?
  - How might they be considered characteristic of their period?

"A mathematician, like a painter or a poet, is a maker of patterns. If his patterns are more permanent than theirs, it is because they are made with *ideas*" G.H. Hardy



PAST EVENTS

What would the effect have been?

Gunpowder Plot

- ***What effect would the explosion had if it had come off?***
  - Take children to the field ~spread out to show range of destruction ~ use cones to mark out

https://www.youtube.com/watch?v=zI9WMJX85Eg
(1.00.35 -1.02.35)



How did this site work?



Hampton Court

- Map out who would have used the different parts of the palace.
- Mark with coloured stickers the different people who would have used to rooms

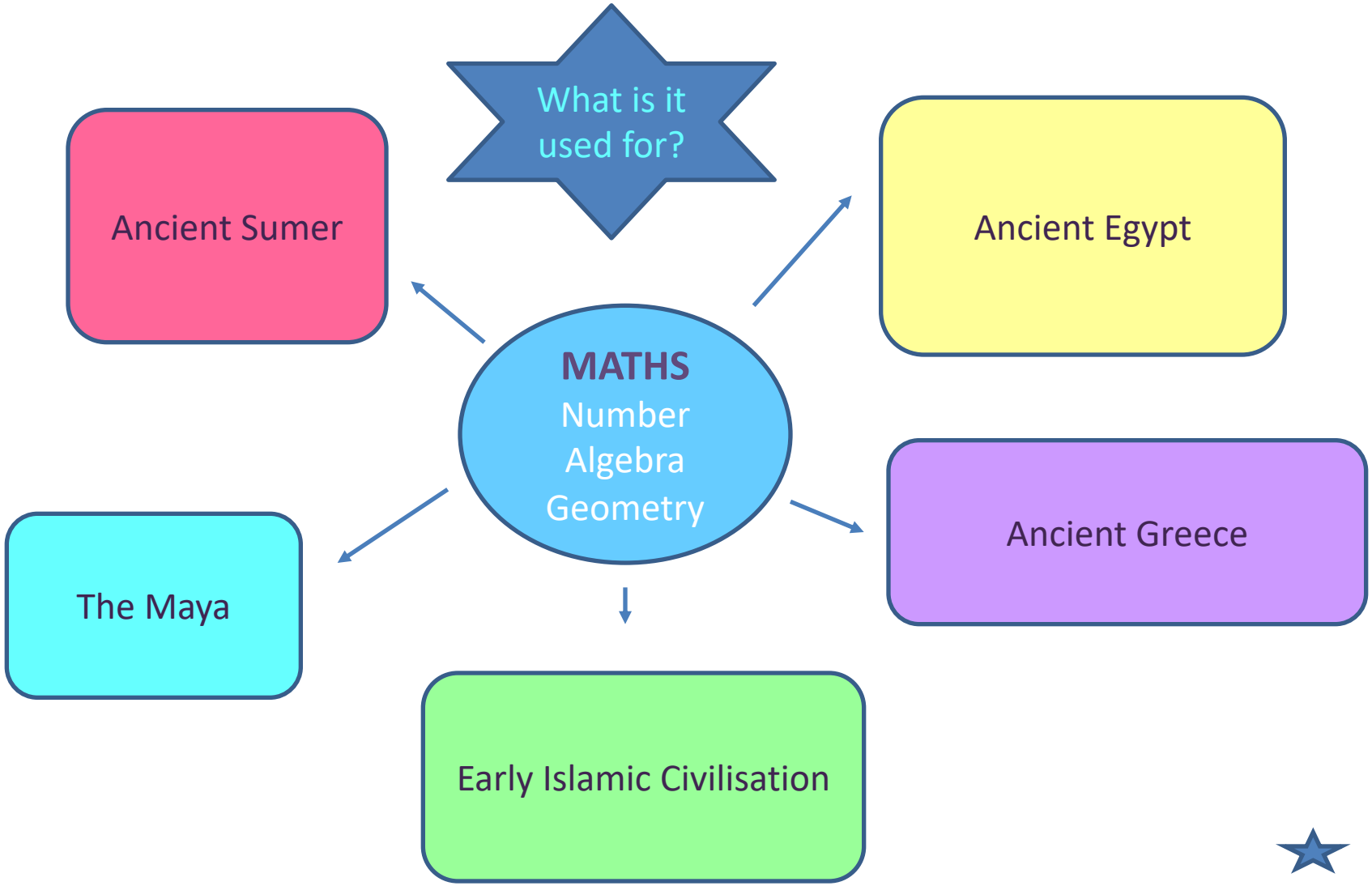
- ***What does this tell us about life in a Tudor court?***

What does maths add to images?

- **The Blitz**
- What ***impression*** do we have from these images ?
- How can this graph ***support*** these impressions?
  - Using it mathematically
  - Using it historically



CALCULATIONS AND NUMBER SYSTEMS


What is it used for?
Ancient Sumer
Ancient Egypt
MATHS
Number
Algebra
Geometry
The Maya
Ancient Greece
Early Islamic Civilisation