

MU120 Video Notes

Maths as others see it – Band 1 of MU120 Tape

Hotel Services Manager

Breaks cleaning routines down into management chunks, then further into each specific area and breaks those down more into time frames. Inputs this into a spreadsheet with a formula to figure out the amount of time that it will take to clean certain areas.

Nurse

Uses graphs for estimating haemoglobin for patients while also using diagrams to illustrate probabilities to patients of hereditary tendencies.

DJ

Uses math to work out music playing time with standard reference points for news, commercials.

- (a) (i) See above.
(ii) Yes, on some level they use math consciously but they don't see themselves as always using them and/or don't think of it in those terms.

- (b) (i) yes.
(ii) yes.

Interesting bits or concepts:

RN showing father how he can pass on disease.

Manager using spreadsheet for time spent cleaning.

Using judgements – decision-making skills.

That are all mathematicians because they use math in some form – both on and off the job – its and everyday, minute skill being used.

- (c) Pros/Cons of using video.

Con – passive viewing – not very interactive

Pro – shows things easily that might be difficult to understand in written form.

Seeing Through Mathematics – Taking off – OU BBC2 Program

Seeing math more than just numbers and calculations.

Bungy jumping is made possible by math for length of rope and by weights of participants.

Money is more than the arithmetic of adding but geometry in its shape. Math is used to get the right impression on each coin. Circle is not the only coins that can role. The £0.20p coin is a good case in point. Each of the seven sides has fourteen angles, each of which is a perfect arc of a circle outline.

Will coinage be replaced by electronic money?

Teachers use sport to teach trigonometry – using everyday items mathematically.

Main message being math is used in a number of ways that we don't always think of as being sums and calculations.

Women in the Work Place – Band 2 of MU120 Tape

Jenkins sexist remark – 1979.

Bella was born in 1922 and at 14 started working.

Directed to work at the ship building yard in Dundee. Was allowed to work only if the women left at the end of the war. Men were paid about £7.00 per week, while the women were paid £2.12s6d.

When she asked for a raise all the men were asked to devise the test. When she passed her salary was increased to £3.14s.10d. This was still less than her male counterparts, doing the same job.

Overtime was compulsory – 3 nights and 2 Sundays out of 4. After working 92 hours Bella finally brought home £7.00 same as the men however they had only worked 48 hours.

Extract 2

40 years of working for women and there were still loopholes in the legislation. Equal pay for work 'of equal value'.

Part-timers are paid less. Employers cut hours to avoid the equal pay rules. Some women were even moved from their job so as not to be compared to a man that way the employers could pay them less.

Extract 3

From 1970 women's pay versus men's went from 63.1% to 1977 at 75.5%. However in 1984 it dropped to 73.5%.

Does skill equal same value?

Question 1

If the woman has qualifications for her job same as a man but doing different work.

Question 2

Yes, their jobs were just as demanding as the man's.

Extract 4

Unskilled (non-manual workers) 62% of hourly rate in 1989.

Question 1

Employers are trying to increase profits via loopholes in the law. Attitudes of employers and men.

Question 2

Making it a fairer comparison between men and women because more women work part-time.

Seeing Through Mathematics – Wood, brass and baboon bones – OU BBC2 Program

Ten thousand years ago a baboon bone was found with a group of notches – some think it was used as a way of tracking the moon.

Mathematical models are everywhere.

Some word definitions:

Astrolabe - An early form of sextant

Sundial - Indicates the daylight hours by the shadow that the gnomon casts on a calibrated dial

Zenith - The point above the observer that is directly opposite the nadir on the imaginary sphere against which celestial bodies appear to be projected

Various things were used for counting; abacus, wooden notches, clay stones, string knots.

Napier Rods – named after John Napier (1550-1617). Invented Logarithms and many other things. See page 396 of math dictionary for more.

Polynomials - A mathematical expression that is the sum of a number of terms – also see page 458 of math dictionary.

Charles Babbage – eliminating multiplication and division in the mechanism and is the basic principle of his engines.

Lord Kelvin – pushed forward Babbage's ideas his Tide Predictor is the coming together of technology and mathematical modelling (tie in with the baboon bone!).

Seeing Through Mathematics – A Source of Inspiration – OU BBC2 Program

Spirals can be modelled mathematically.

Important feature – size doesn't matter with spirals.

What is a spiral?

Coiled winding continually about and constantly receding from a centre, whether remaining in the same plane like a watch-spring or rising in a cone, winding continually and advancing as if along a cylinder, like a thread of a screw.

Helix - A curve that lies on the surface of a cylinder or cone and cuts the element at a constant angle

Sinusoidal - Having a succession of waves or curves

Pitch of the helix – radius and pitch of every helix isn't the same.

Helix can be described as a continuous coil, circular in one projection and where the distance between the successive parts of the coil is always the same.

The sense of the spiral depends on the view – can be clockwise or anti-clockwise.

The waves in a helix are called the frequency. The distance between the coils is called a constant.

Archimedian spiral – a spiral, with polar equation, see page 28 of math dictionary for formula and example. With an enlargement or contraction it stays the same.

Nautilus - Cephalopod mollusk of warm seas whose females have delicate papery spiral shells

Self-similarity was mentioned – see audio notes for definition of this.

Essential features of spirals – how the distance from the centre (or radius) changes as we go around the spiral.

Radius and angle are in proportion. Radius is always some constant multiple of the angle.

Linear - directly proportional

Equiangular spiral – another term for logarithmic spiral.

Fema Spiral – was mentioned but can't find definition. Have written pine cone, sunflower, orbit of spacecraft in outer space. Might be examples?

Hotspots – Unit 4 Band 3 MU120 Tape

Apparent features in small samples may just be the result of chance variation.

Data collection can be problematic, Data collected may not be reliable, and Data collection deserves serious consideration, Discrete/continuous variables.

Statistical studies can involve huge amounts of work

Four and twenty Seabirds – Unit 5 Band 4 MU120 Tape

Posing How many guillemots are breeding this year and how does that compare with previous years.

 Have to count birds

Collecting Difficulties in finding birds

Analysing Averaging the data over time – population estimate

Interpreting Need previous year's numbers.

Skomer Island has $\frac{1}{3}$ the world's population for guillemots.

Seeing Through Mathematics –The passionate statistician – OU BBC2 Program

Missed program – forgot to tape it. =(

Getting your bearings – Unit 6 Band 5 MU120 Tape

Survey crews for an OS map takes many measurements. OS maps aim to be updated every 6 months.

Contour lines - Every 50-meter contour line is drawn in bold so that it's easier to pick out. When contour lines are squeezed together it means it is steeper. When contour lines are spread out it is relatively flat.

Steepness is about the only thing you can tell from the map (i.e. what is stressed and what is ignored).

Saddle point – max point in one direction and minimum point in another direction. Hollins Cross is suppose to be a good example, however it is difficult to tell this because of the scale of the map and all of the other information printed on the map.

Single Track Minds - Unit 7 Band 6 MU120 Tape

Using network maps for train schedules. Activities associated with this band are in Learning File.