

# OUTSTANDING TEACHING, LEARNING AND ASSESSMENT TECHNICAL SKILLS NATIONAL PROGRAMME

Output 6 Employer Led Functional Skills Maths Extended PBL Tasks  
Created by: A range of employers connected to Derby College

Managed by Melanie Lanser

## **Problem-based Learning – Functional Skills Maths**

### **Employer Ideas**

#### **Derby Museum and Art gallery**

We have both a cafe and two shops within our museum trust that have to make a profit especially now we are a charity. Therefore, there are lots of mathematic problems working out cost and retail prices. Also, in the cafe we have to calculate to the penny any waste so again this can be part of the project. Finally, we calculate average spends, and the spend per head and use this to do business projections. They can then help to transfer these figures into business reports with graphs and charts.

The other scenario is designing a room for corporate events and calculating table capacity in the room allowing certain room for live music, fire exits, dance floors. Then costing it all out to work out ticket prices and how much profit we are left with at the end of the event.

Finally, there is another scenario of designing an exhibition of paintings. We can give them dimensions of a room and a whole range of paintings that they would have to measure and evenly hang across the walls of a gallery.

## **Problem-based Learning – Functional Skills Maths**

### **Employer Ideas**

#### **F10 (Artist Management)**

##### **Exchange rate**

Paying artists at \$1000 per gig

US Dollars to Pounds: \$1000 = UK pounds

US Dollars to Euros: \$1000 = Euros

Calculation rate – may take from UK account not USD as rate is better

**DJ booked to perform in Mexico – will have to take 25% tax off**

Expenses can be set against it

DJ would like £1000.00 per gig

Fights \$xxxx

Bags \$xxx

Equipment \$xxx

Accommodation xxxxx

Internal transport xxxxx

Agents fee 25%

What is the fee needed to cover the total cost

**Payment - is not free**

Mexico - cost effective way to carry out international transfers

“stripe” payment system cost 2% per transaction

Check for best rate /lowest rate

How to get money back to GDP

\$1000 best way to do it – changes all the time

Need to consider the transaction % / cost

**2 clubs in Mexico want a DJ.**

1 – Cancun

2 – Puerto Vallarta

They need to be there Friday evening for a Saturday event and a Sunday event

1 is offering \$3000 + travel and accommodation - Cancun

2 is offering \$4500 no travel or accommodation is included – Puerto Vallarta

Look for direct and indirect flights – skyscanner

Accommodation costs need to be taken in to consideration

Calculate the cost for each one

Artist will want £1000,00 per gig

Agency 20% fee

25% tax need to be taken into consideration

Payment USD, Pounds, Euro need to be included 2% per transaction

Equipment hire \$200

Local transport

**Tour 3 gigs in the same week in the following locations**

Ibiza - Thursday

Split, Croatia - Friday

Rimini, Italy – Saturday

Fights from the UK to Ibiza for Ibiza to Croatia, Croatia to Italy, Italy to UK

Accommodation – not included

Local transport

Equipment hire - @ £500 per night

Artist will want £1250 per gig

Agency 20% fee

What is the total cost to the clubs?

**Pod casts**

Host aspect cost

Life span needs to be considered – needs to last 2 years

Limited Online Music Licence & Performing Rights Society Licence – costs

LOML only lasts for 1 year with max number of hits 75,000

Month	Clicks
1	50
2	100 + 60 on pod cast 1
3	250 + 65 pod cast 1 + 50 pod cast 1

4	Up 35% on month 3
5	Up 50% on month 4
6	Down by 23%
7	Up 35% on month 5
8	Up 25% on month 7 + 100 on pod cast 6 and 7
9	Down by 12% on month 8
10	Up 13% on month 8
11	Same as month 10
12	Up 25% on month 11

Can be paid per click

10p x first 1000 clicks

12p per click after 1001 clicks

Producer costs £250 per episode

Marketing – facebook campaign £100.00 each campaign

How many clicks do you need to cover the costs

## Problem-based Learning – Functional Skills Maths

### McDonalds Employer Ideas

#### Speed in the drive thru lane.

Speed in the drive thru lane is critical to a great customer experience. Customers use the drive thru for speed and convenience.

A maths problem could be linked to speed in the drive thru lane and the amount of cars that we serve in one hour.

The record number of cars served in one hour is 113 cars.

In 1 Hour if we serve 60 cars this would be 1 per 60 seconds.

In 1 Hour if we serve 120 cars this would be 1 every 30 seconds.

There are multiple factors that can impact a shift and impact sales and the speed in the lane.

For Example ... practical application ...

Item unavailable on the menu

Ran out of stock

Not prepared - insufficient stock on floor

Crew socialising

Targets not communicated (motivation /Drive)

Equipment breakdown e.g. Credit card readers, shake machine, grills, coffee machine

Crew member running late/ phoned in ill.

Uniform issues

We could accommodate a field trip out to the Breadsall Restaurant to observe the drive thru if this would be beneficial?

## **Problem-based Learning – Functional Skills Maths**

### **Employer Ideas**

#### **Two ideas for East Midlands Airport are:**

##### **1. Aircraft Turnaround time.**

In order for aircraft to stick to the 'low cost' model, and achieve 4 rotations a day, then the challenge is to turn an aircraft around in 20 minutes. This includes a number of steps including taxi to stand, passengers get off, luggage off, clean, luggage on, passengers on, catering on, fuel on, safety checks etc. There are lots of maths problems that could be made out of this, and you could even extend the problem out to getting the full 4 rotations out of 2 x 12 hour shifts, in other words, build in flight times to destinations and the challenge is how do you fit in 4 flights with

one aircraft, bearing in mind limitations around runway use (can only take off after 6am, need final flight to arrive before a certain time without incurring night noise charges etc.

## **2. Security queue times.**

Our biggest challenge at EMA is managing very large numbers of people at peak time. The one function that EVERYONE needs to get through regardless of what flight or how they are travelling is Airport Security. At peak times (slot 1) we can process 25% of our daily passengers in just a few hours, and only have a limited number of security lanes. Lots of maths problems can be made out of this, so you can start with the basics of you have say 8 security lanes and xx number of passengers and it takes xx minutes to process each passenger under normal conditions, or ... we are expecting a flight at xx time and there are xx passengers that will be checking in at xx time, and will need to get through security at xx time to get to their boarding gate by xx time, how many security lanes will we need open... then you can start throwing problems at them like a member of staff has called in sick, what effect will this have on queue time. Or different passenger profiles take different lengths of time to get through security (young, old, disabled, families, business travellers etc) so you can work out how this mix will affect queue times. Or a certain initiative can shave xx seconds off the average time it takes to process someone, for example a 'queue comber' reminding passengers to take their laptops and liquids out of their bags, take their belts off and coins out of their pockets – what is the total time saved... etc.