

Write your name here

Surname

Other names

Pearson
Edexcel GCE

Centre Number

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Candidate Number

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Applied Information and Communication Technology

Unit 3: The Knowledge Worker

COVER SHEET

18 – 22 May 2015

Paper Reference

6953/01

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Punch a hole in the top left corner of each printout.
- Ensure your printouts are in the correct order and attach them to page 2 of this cover sheet using a treasury tag.

P42607A

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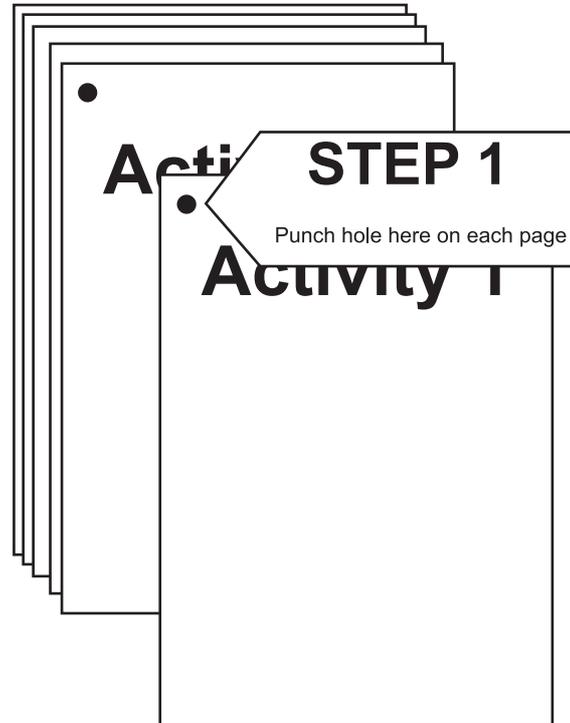
1/1/1/1/1



Turn over ►

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Put 'treasury tag'
through this hole



STEP 2 Arrange your pages in this order, face up.

Activity 1
Activity 2
Activity 3
Activity 4

STEP 3 Put a 'treasury tag' through all
your pages

STEP 4 (last)



FOR EXAMINER'S USE ONLY

SWW		
1		
2		
Total		

A1		
A2		
A3		
A4		
SWW		
Total		

Activity 2			
(a)	1		
	2		
	3		
	4		
(b)	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
(c)	1		
	2		
(d)	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
(e)	1		
	2		
	3		
	4		
	5		
	6		
(f)	1		
	2		
	3		
Total			

Activity 1			
(a)	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	13		
(b)	1		
	2		
	3		
	4		
	5		
	6		
Total			

Activity 3			
(a)	1		
	2		
	3		
	4		
	5		
	6		
(b)	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
Total			

Activity 4		
MB1		
MB2		
MB3		
Total		



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Pearson Edexcel GCE

Applied Information and Communication Technology Unit 3: The Knowledge Worker

18 – 22 May 2015

Time: 2 hours 30 minutes

Paper Reference

6953/01

You must have:

Cover sheet, short treasury tag, Truckles_exam.xlsx, Foundation Letter_exam.pdf, Price List_exam.pdf, Selling Letter_exam.pdf

Instructions

- Complete your candidate details on the cover sheet provided.
- All printouts must contain your name, candidate number, centre number and activity number.
- At the end of the examination:
 - all printouts should be placed in the correct order
 - use a treasury tag to attach your printouts (**as shown**) to page 2 of the cover sheet.

Information

- The total mark for this paper is **90**. There are **four** activities in this examination totalling 88 marks. Further marks are allocated to Standard Ways of Working.
- The marks for **each** question, within an activity, are shown in brackets
 - use this as a guide as to how much time to spend on each question.
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
 - you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

Advice

- Read through the Scenario carefully.
- Work through the activities in order.
- Attempt **ALL** activities.
- Label your printouts clearly as instructed.
- Printing must be undertaken within the examination time.

Turn over ►

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Warning

At the time of writing there is no such fish as a truckle. This scenario is fictitious and should not be used in any way as guidelines for breeding tropical fish.

Scenario

Truckles

After nearly 40 years of teaching biology, Trevor Rose decided to take a well-earned retirement. He was aware that he would need to find something to do to keep his body and mind active. As he wasn't much of a gardener, the usual retirement pursuits were not attractive to him. Bearing in mind that there is a limit to the amount of golf a 61-year-old can play, Trevor decided to develop his other interest and breed truckles.

Truckles are small tropical fish similar to guppies. The male fish has a large, colourful fantail, which varies in colour depending on the strain. The female fish, as is often the case, is less striking than the male. Visually, there is no way of identifying the strain of a female fish, as they are all greyish-brown in colour.

Although the males are different colours they are basically the same fish and can breed, without restriction, with all female truckles. The males get their colour in a similar way to the way we get our hair colour. It is based on a combination of two genes, one from the father and one from the mother. The female truckles will have a similar combination of genes, but this will not be detectable visually.

A breeding cycle starts every four weeks in a breeding tank. The breeding tank can hold up to 32 fish. It has been found that the best results occur with 16 males and 16 females. Breeding truckles is complicated by the fact that the male truckle has a tendency to eat its own young. After four weeks, the females are removed to give birth in a separate tank called the holding tank.

After four weeks in the holding tank the adult females will have had their young and are removed and placed in the stock tank. This tank is where fish are stored. The baby truckles remain in the holding tank for another four weeks whilst they grow to maturity. At this point, they are placed in the stock tank.

Fish in the stock tank can either be placed in the breeding tank for the next cycle, split into batches for sale and placed in a selling tank or simply stored until the next cycle. From the selling tank the fish are sold to a retailer.

In order to produce truckles for sale every four weeks, Trevor needs a breeding tank, two holding tanks, a stock tank and a selling tank. He also needs filters to keep the water clean and heaters to keep the water at a temperature suitable for tropical fish.

Being thorough, Trevor contacted the Truckle Foundation, a society of truckle breeders, who have advised him on the size of the tanks and the number of filters and heaters each one requires. They have also supplied him with a spreadsheet model that uses genetic theory to calculate the number of each strain of truckle produced under given circumstances. Trevor has tried to expand the model so that it will also predict his cash flow should he go ahead with the project. Unfortunately, he did not have the skill and knowledge to complete the model.

Trevor has contacted a local tropical fish retailer called 'Fish Place' and asked for equipment prices.

Trevor will sell his surplus fish to 'Fish Place' in batches. 'Fish Place' will define the batch sizes and the price per batch. A batch will consist of a set number of a particular strain of male truckle. As there is no way of telling the strain of a female truckle, batches of female truckles are not restricted to one particular strain. Depending on fashion, some strains of male truckle are more desirable and therefore more valuable than others.

Trevor has made some notes on the spreadsheet model.

Worksheet	Description
Genetics_1,2,3 (Hidden Worksheets)	These worksheets were supplied by the Truckle Foundation as part of the original spreadsheet model. It was explained to me that 'Genetics_1' is a matrix that shows the proportions of each strain of truckle produced in the breeding process. Each union produces one of four options defined by two letters. 'Genetics_2' then converts these to a strain of truckle. To be honest I found it hard to follow so I have hidden the worksheets.
Input Page	I added this summary page. The original model allowed me to enter the number of each strain of male truckle I put in my breeding tank for each cycle ('Breeding Tank 1'). I wanted to create a summary page to input this data and also show the costs, revenue and profit for each cycle. This is so that I can see the results of my changes at a glance.
Breeding Tank 1	This worksheet was part of the original model and displays the number of each strain of truckle in the tank during each cycle. Initially this was the 'Input Page'.
Holding Tank 1a	This worksheet was also part of the original model. It shows the number of each strain of truckle in this tank at any one time. As the baby fish stay in this tank for eight weeks, we need two of this type of tank and we alternate their use.
Holding Tank 1b	Part of the original model, shows similar information to 'Holding Tank 1a'.

Stock Tank (Pre)	This worksheet was also part of the original model and shows the number of each strain of truckle in the stock tank prior to removing the truckles wanted for the breeding tank. I have had to modify this slightly as I have added the 'Selling Tank' and 'Stock Tank (Post2)' worksheets.
Stock Tank (Post1)	This worksheet was also part of the original model and shows the number of each strain of truckle in the stock tank after removing the truckles wanted for the breeding tank.
Selling Tank	I have added this worksheet and will show the number of each strain I remove to be sold.
Stock Tank (Post2)	This worksheet is new and will show the number of each strain of truckle in the stock tank after removing the truckles to be sold.
Buy	This is also a new worksheet. To start breeding I will have to have one set of male truckles and two sets of female truckles. As I will not require the second set of female truckles until after the first four weeks I have set up this worksheet to represent this.
Prices	Another new worksheet. This is where I will put the cost of all my requirements in this process. It will also contain the batch sizes of each strain of truckle and the price I will be paid per batch.
Revenue Costs	In this worksheet I will calculate the costs and projected revenue for the project over a period of time. A summary of this information appears on the 'Input Page' worksheet.

Some cells in the model are password protected. Should you wish to experiment with the model, the password is *edexcel*. Be aware that if you change the contents of any protected cell the model may not work.

Your Task

Trevor plans to move to Truro in Cornwall to enjoy his retirement and has realised that he does not have the modelling skills to actually complete and use this model. He has asked you as an IT student to complete the model and advise him on the numbers of each strain of male truckle to put into the breeding tank over a period of time.

Instructions to Candidates

All printouts **MUST** have a header and a footer. The header must contain the activity number. The footer must contain your name, candidate number and centre number.

Minimum font size of 10 should be used throughout.

All spreadsheet printouts should show gridlines and row and column headers.

For some of your spreadsheet printouts you may need to adjust column widths. To do this you will need to unprotect the worksheets. The password is *edexcel*.

Activity 1 – Understanding the situation (suggested time 25 minutes)

You have been asked to complete the Truckles spreadsheet and advise Trevor Rose on which truckles to breed. Read the scenario carefully.

On **one** sheet of A4:

- (a) Using bullet points or a numbered list, state **13** points from the scenario you consider relevant to the model.

(13)

- (b) Open the spreadsheet **Truckles_exam.xlsx** and examine the 'Prices' worksheet.

There are areas where data has to be entered (pink areas).

In a table, list the data sources you will use and for each source identify the data item(s) that source will provide.

(6)

Save and print your work.

(Total for Activity 1 = 19 marks)

Activity 2 – Completing the model (suggested time 40 minutes)

You should ensure that each printout is on **one** sheet of A4 only.

The model is stored as **Truckles_exam.xlsx**

Open the spreadsheet model and familiarise yourself with it.

(a) Prices (Data Entry)

- Your electricity supplier has quoted you 9p per kWh for electricity. Enter this into the appropriate cell on the 'Prices' worksheet.
- Using information from **Foundation Letter_exam.pdf**, **Price List_exam.pdf** and **Selling Letter_exam.pdf**, enter appropriate values in all the other cells where data has to be entered (pink areas).
- Print off columns A–I and rows 9–39 of the 'Prices' worksheet showing **data**.

(4)

(b) Prices (Formulae)

Cells F21:S21 of the 'Prices' worksheet will show the number of heaters that will be active during a particular four-week period. Cell F19 contains the number of Watts of electricity a single heater will use in one hour and cell B20 contains the cost of electricity per kWh (the cost of using a 1 kW device for one hour).

- Enter a formula into cell F23 of the 'Prices' worksheet to calculate the cost of electricity for running all the heaters 24 hours a day for the first four weeks.

Note: There are 1000 W in a kW.

(It should be noted at this point that the heaters are controlled by a thermostat and would not actually be on 24 hours a day. In this situation we are looking at a worst case scenario.)

- Replicate this formula across to S23.
- Enter a formula into cell F24 of the 'Prices' worksheet to calculate the cost of electricity for running all the filters 24 hours a day for the first 4 weeks.
- Replicate this formula across to S24.
- Enter a formula into cell F25 of the 'Prices' worksheet to calculate the cost of electricity for running all the filters and all the heaters 24 hours a day for the first four weeks.
- Replicate this formula across to S25.
- Print off columns E, F and S and rows 21–25 of the 'Prices' worksheet showing **formulae**.

(11)

(c) **Breeding Tank 1**

- Enter a formula into cell B12 of the 'Breeding Tank 1' worksheet to read the value from cell B12 of the 'Input Page' worksheet.
- Replicate this formula to cell O21 of the 'Breeding Tank 1' worksheet.
- Print off columns A–D and N–O and rows 9–21 of the 'Breeding Tank 1' worksheet showing **formulae**.

(2)

(d) **Selling Tank**

In the 'Selling Tank' worksheet, formulae in C12:O21 will calculate the number of fish of each strain of male truckle that can be put in batches ready to be sold.

- Enter a formula into cell C12 of the 'Selling Tank' worksheet to find the number of 'Night Hawk' male truckles that can be put in batches ready to be sold.

This formula will need to be replicated both along and down.

Hint: Each batch must contain the correct number of fish of the given strain. The 'Stock Tank Post1' worksheet shows the number of each strain available to put into batches.

- Replicate this formula to cell O21.

The cells in the range C22:O22 will calculate the number of female truckles that can be put in batches ready to be sold.

- Enter a formula into cell C22 of the 'Selling Tank' worksheet to find the number of female truckles that can be put in batches ready to be sold.
- Replicate this formula across to O22.
- Print off columns A, C and O rows 9–22 of the 'Selling Tank' worksheet showing **formulae**.

(11)

(e) **Stock Tank (Post 2)**

- Enter a formula into cell C12 of the 'Stock Tank (Post 2)' worksheet to display the number of male 'Night Hawk' truckles left after those to be sold in week four have been removed.
- Replicate this formula to O21.
- Enter a formula into cell C23 of the 'Stock Tank (Post 2)' worksheet to display the number of female 'Night Hawk' truckles left after those to be sold in week four have been removed.
- Replicate this formula to O32.
- Print off columns A, C and O and rows 8–13, 19–24 and 30–33 of the 'Stock Tank (Post 2)' worksheet showing **formulae**.

(6)

(f) **Printouts**

- Collect your printouts together, ensure you have printed them correctly and that they are in the order you have been asked to print them.

(3)

(Total for Activity 2 = 37 marks)

Activity 3 – Using the model (suggested time 40 minutes)

- (a) To use the model you enter the number of each strain of male truckle you want to use for breeding into the cells in the range D12:O21 of the 'Input Page' worksheet. You will not be able to change the values for the first two breeding cycles as you only have 16 male truckles available. You should not put more than sixteen male truckles in the breeding tank and if you put in fewer than 16 then there will not be as many young produced. Trevor would like to make as much profit in his first year as possible.

- Use the model to experiment with different combinations of male truckles.
- Take a screenshot of the 'Input Page' worksheet and paste it into a document.
- Annotate the screenshot, describing what you did to maximise the profit.

(6)

- (b) Recently two of the main breeders of 'Yellow Tiger' truckles have stopped breeding. This has led to a shortage of 'Yellow Tiger' truckles. 'Fish Place' has asked Trevor if he would like to specialise in 'Yellow Tigers'. They say that they will still pay the same rate for the other truckles but would pay £350 for a batch of 50 'Yellow Tiger' males.

- Change the model to reflect the new deal for 'Yellow Tiger' males.
- Take a screenshot of what you have changed and paste it into the document you used in 3(a).
- Annotate the screenshot and explain what changes you made and why you made them.
- Use the model to experiment with different combinations of male truckles, trying to maximise the number of 'Yellow Tiger' males you can sell.
- Take a screenshot of the 'Selling Tank' worksheet and paste it into the document.
- Annotate the screenshot to show at what point(s) you will have a batch of 50 'Yellow Tiger' males for sale.
- Take a screenshot of the 'Input Page' worksheet and paste it into the same document.

(11)

(Total for Activity 3 = 17 marks)

***Activity 4 – Report (suggested time 35 minutes)**

In Activity 3 you used the model to create solutions for two options:

- General breeding
- Specialising in 'Yellow Tiger' males

Write a report for Trevor Rose.

The report should include:

- a suitable title
- an introduction explaining what the report is about
- a description of Option 1 (general breeding)
- a description of Option 2 (specialising in 'Yellow Tiger' males)
- your recommended option with a justification of why you recommend this option.
Use screenshots, tables and charts to support your recommendation
- improvements and enhancements that could be made to the model
- a concluding statement.

Proof read your report.

Marks will be awarded for the Quality of your Written Communication.

Save and print your work.

(Total for Activity 4 = 15 marks)

Standard Ways of Working

All printouts must contain the activity number, your name, candidate number and centre number.

Pages must be securely fastened to the cover sheet and in the correct order.

Minimum font size of 10 should be used for all word processed documents.

(Standard Ways of Working = 2 marks)

TOTAL FOR PAPER = 90 MARKS

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