

Poolside pranksters

A group of students have been playing pranks at their university. They've been attempting to turn the university swimming pool bright pink. The local paper has been reporting on the story.

You are going to use your biology knowledge and skills to investigate how they're doing it. You will need to use your Working Scientifically, maths, and literacy skills too.

Project overview

There are four parts to this project.

Part 1

You are going to read an article about the student pranksters. You will be given some questions to answer. In pairs or groups, you can then discuss ideas about the science involved. You can work together to think about how to investigate how the students are carrying out their prank.

Part 2

You are going to plan an investigation. There are some questions to help you. Your answers will be assessed.

You will then carry out your investigation.

Part 3

You will answer some questions about your investigation. Your answers will be assessed.

Part 4

You will summarise what you have done in a Big Write. You will write a newspaper article using what you learned in your investigation.

Part 1

Read the article. Then answer the questions on the next page to show you have understood it.

The **Activate** Herald

Wednesday 20 November, 2013

45p

PINK POOL PRANKSTERS PROVE PROBLEMATIC

Staff members at the local university swimming pool are facing a peculiar problem. Someone has turned their swimming pool pink.

The problem was first noticed last Thursday evening by cleaner Les Lambert. Les said: 'I arrived at the pool. Everything seemed normal at first. When I came to clean around the pool-side I noticed something strange. There seemed to be something large and pink floating in the middle of the pool. I fished it out, but it had left a small amount of pink liquid in the pool.'

The following evening when he arrived at work, he noticed more pink objects in the pool, and this time the pool had started to turn pink. Les reported that there were two objects in the pool this time. They were about half the size of the object from the previous evening.

After Friday night's attempt to turn the pool pink, security was tightened. The pranksters, though, were determined, and finally managed to turn the pool pink on Sunday.

The manager of the pool, Eliza Lovegood, had this to say: 'On Sunday evening, I was called by security to tell me the swimming pool was pink. On arrival at the scene, I was horrified to see a bright pink swimming pool, with lots of small objects floating in it. We will have to close the pool until the issue is resolved. We don't understand how this has happened.'

Security reported that all doors were locked at the pool, and no people were in the pool area after closing time. The objects must have entered the pool through a small window that was found to be open.



Les Lambert, the cleaner who first reported the problem.

Questions

- 1** The objects were found to be made out of a thin material, filled with a pink dye. Name the scientific process that helped turn the pool pink.

(1 mark)

- 2** Describe each of the different attempts to turn the pool pink, detailing the factors involved.

1 _____

2 _____

3 _____

(6 marks)

- 3** Suggest **one** reason why the pranksters were not successful until the third attempt. Explain your answer.

(3 marks)

Group discussion and research

In your groups, discuss the science behind the article. You can use Topic B1 1.4 in your book as a start, but you can also do some research. You may want to divide the research between group members.

Here is a selection of websites that you can use:

- <http://morningsidemicro.wikidot.com/why-cells-are-so-small>
- www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/cells/cells3.shtml

While you are doing the research, think about how you can design an investigation.

Deciding on a question

In your group, write down a list of ideas or questions that you could investigate. You need to decide on the question that you will investigate. Remember, it must be:

- a scientific question
- a question that you can answer by collecting data.

Part 2

Questions

1 a Think about your research. Name **two** sources that you used.

1 _____

2 _____ (2 marks)

b Which one of the sources helped you most with your plan? Circle 1 or 2.

1

2

Explain your answer.

_____ (1 mark)

2 Write down the question that your group has decided to investigate.

_____ (1 mark)

3 Explain why your group has decided to investigate this question.

_____ (2 marks)

- 4 a** Describe how you plan to carry out your investigation. You will need to make sure that you have explained everything carefully.

This is a QWC question. You will get marks for:

- organising information clearly
- spelling and grammar
- using good English
- using scientific key words.

(6 marks)

Your plan should include the following:

- a prediction
- the variables that you will change, measure, and control
- what equipment you plan to use
- what you plan to do
- how you will do the investigation safely
- how you will collect data that is precise and accurate.

- b** You should draw a table for your results to include in your investigation plan.

(2 marks)

Investigation plan

[illegible]

B1

Big practical project

Higher

Activate

[illegible]

Part 3

You have now completed your investigation.

In this part you will be **working independently** to:

- answer some questions about your investigation
- answer some questions about a similar investigation.

Questions

1 Name the variables in your investigation.

The independent variable was _____

The dependent variable was _____

One variable I controlled was _____

_____ (3 marks)

2 Look at your results.

a Did you repeat any results? Circle your answer.

Yes

No

b Explain why you did or did not repeat your results.

_____ (3 marks)

3 a Draw a graph of your results. You should use graph paper. (3 marks)

b Look at your graph. Does it show a trend? Circle your answer.

Yes

No

Not sure

Describe what your results show.

(3 marks)

c Write down your prediction from part 2.

My prediction _____

Do your results support your prediction? Circle your answer.

Yes

No

Not sure

Explain your answer. You should use examples from your results.

(3 marks)

- 4** A drinks company have been investigating tea bags of different size and shape to see which bag helps the tea brew quickest.

To help them take measurements they are using red dye crystals instead of tea. They have recorded the time it takes for the water to turn completely red. Each tea bag contains the same number of dye crystals. Their results are given in the table.

Shape of tea bag	Surface area of teabag (cm ³)	Time taken for water to turn red (s)		
		Measurement 1	Measurement 2	Mean
flat	16	76	74	
pyramid	42	34	35	

- a** Complete the table by calculating the mean time for each tea bag. (2 marks)
- b** Write a conclusion based on these results.

_____ (2 marks)

- 5** Explain how these results link to your experiment and the article.

_____ (3 marks)

- 6** Suggest one possible improvement for your investigation and give a reason for your answer.

_____ (2 marks)

Part 4

The task

You are going to write a newspaper article. Your newspaper article will be for the Activate Herald. It will tell the story of your investigation and explain how the pranksters in part 1 could have turned the pool pink.

There are three steps in this task.

- 1 Planning:** You should always do some planning before you start a Big Write. Choose all of the information you want to put in your article. You can use the planning grid on the next page.
- 2 Big Write:** Now you are ready to write your article. Make sure you look at your plan as you write. You should check what you have written afterwards. You could also ask someone else to read it for you.
- 3 Optional group work:** Work in groups to look at some newspaper articles about science. Make a list of the things you think are important for a good article.

Brief from the Editor

Hi,

Thanks for agreeing to write this article for the paper. Please include:

- *a summary of the key points from the original article about how the pranksters tried different ways of turning the pool pink*
- *a description of what you did*
- *any important results you have that will help people understand.*

Make sure you explain all the science clearly. Most people reading the article will not be scientists.

Yours sincerely,

Angela Ashby (Editor)

Planning grid for newspaper article

Key points from original article
Who was involved in the investigation?
Summary of method
Important data
Summary of conclusions
Ideas for a headline for the article