

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

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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 Pick the correct word from the words shown in bold to complete the sentences.

The pool was attacked by the pranksters three times. The first time the pool was **very/ not very** pink, and the object was **big/small**.

The second time the pool was **more/less** pink. The objects were **bigger/smaller** than before.

On the final attempt the pool was turned completely pink. There were **fewer/more** objects. The objects were **bigger/smaller** than before. (6 marks)

- 2 The objects were found to be made out of a thin material, filled with a pink dye. What scientific process do you think helped the pranksters turn the pool pink? Circle your answer.

deformation

diffusion

respiration

(1 mark)

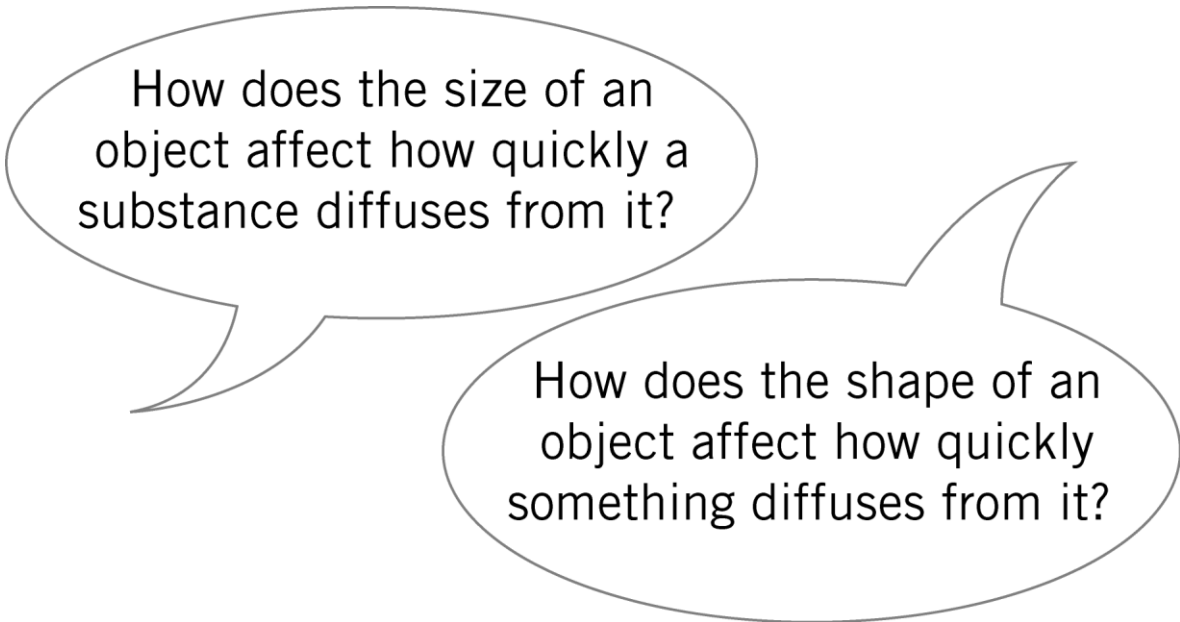
- 3 Describe how you think the pool was turned pink.

(3 marks)

Group discussion

In your groups, discuss the science behind the article. You can use Topic B1 1.4 in your book to help you.

Here are some ideas for questions that you could investigate:



How does the size of an object affect how quickly a substance diffuses from it?

How does the shape of an object affect how quickly something diffuses from it?

Discuss which question you would like to investigate. You need to think how you would collect data to answer the question.

Decide who will write some notes about your discussion. Use the sheet on the next page to help you organise your ideas.

(This is not the plan. You will plan this investigation in the next part, part 2.)

Research

You could also do some research to help you to decide on the best type of question or the best way to do the investigation.

Questions and notes	Tick when done
What makes a good question? Which question do we want to investigate?	
How could we collect data? What equipment do we need? What could we do to collect data?	
How can we do the investigation safely?	
What will our investigation tell us about the issues in the article?	

Part 2

In this part you are going to answer some questions to help you plan your investigation.

Questions

- 1** Write down the question that your group has decided to investigate.

_____ (1 mark)

- 2** Make a prediction about what you think will happen in your investigation.

_____ (2 marks)

- 3** In your investigation you will need to change a variable.

- a** Name the independent variable in this investigation.

_____ (1 mark)

- b** Name the dependent variable in this investigation.

_____ (1 mark)

4 Describe how you plan to carry out your investigation.

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)

Equipment

Safety (risk assessment)



Method

Control variables

5 You will need to record your results in a table.

Draw a table that you can use for your investigation.

(2 marks)

6 Answer this question if you did some research.

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.

_____ (2 marks)

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	75
pyramid	42	34	35	34.5

- a Which shape of tea bag helped the tea brew the quickest?

_____ (1 mark)

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

(3 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