

NAME: \_\_\_\_\_ FORM/GROUP \_\_\_\_\_

# DESIGN AND TECHNOLOGY REVISION BOOKLET

# 2

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## SMART MATERIALS AND MODERN MATERIALS

HYDROCHROMIC INKS  
THERMOCHROMIC INK  
HYDROMORPHIC POLYMERS  
PHOTOCHROMIC INK  
HYDROCARBON ENCAPSULATING POLYMERS

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## SUITABLE REVISION MATERIAL FOR:

PRODUCT DESIGN  
RESISTANT MATERIALS  
GRAPHIC PRODUCTS  
DESIGN AND TECHNOLOGY

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# HYDROCHROMIC INKS

LINK TO HELP AND INFORMATION

<https://www.technologystudent.com/joints/smarty1.html>

1. What are hydrochromic inks? Include a description a practical application of this type of ink. **5 marks**

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# THERMOCHROMIC INK

LINK TO HELP AND INFORMATION

<https://www.technologystudent.com/despro2/inks1.htm>

<https://www.technologystudent.com/prddes1/smart1.html>

2. What are thermochromic ink? Include a description a practical application of this type of ink. **5 marks**

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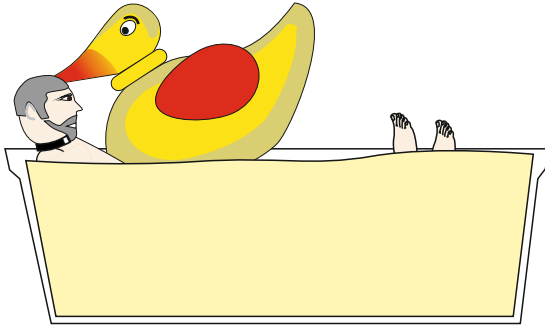
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# HYDROMORPHIC POLYMERS



3a. A simple floating plastic duck, for use in a bath, expands to almost five times its original size, when placed in water.

Describe two other applications of hydromorphic polymers. **2 X 4 marks**

[LINK TO HELP AND INFORMATION](#)

[SEARCH THE INTERNET FOR APPLICATIONS](#)

## Practical Application 1:

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## Practical Application 2:

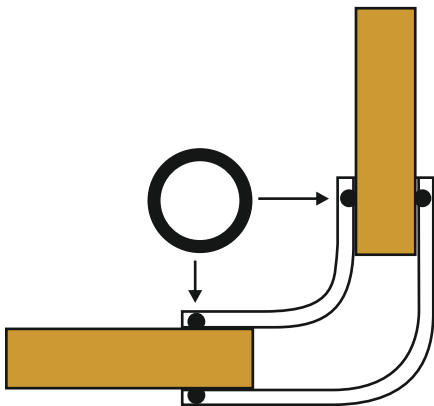
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[LINK TO HELP AND INFORMATION](#)

<https://www.technologystudent.com/joints/hydrom1.html>



3b. The pipe connector, seen opposite, has 'O' rings to prevent leaks. Explain why an hydromorphic polymer is the best material to use in this situation. **4 marks**

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# PHOTOCHROMIC INK

LINK TO HELP AND INFORMATION <https://www.technologystudent.com/joints/photchrom1.html>

4a. What is photochromic ink? **2 marks**

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4b. The three diagrams below, show a UV light torch shining ultra violet light on a test tube filled with photochromic ink.

What will happen to the ink when the light is switched on? **3 marks**

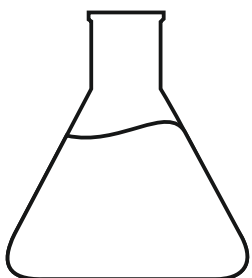
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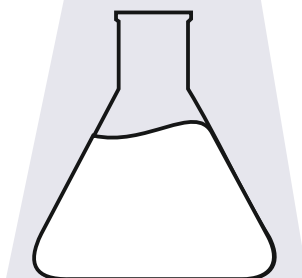
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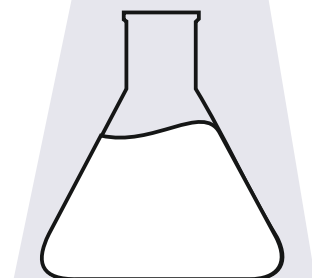
4c. Complete the diagram, by adding shade to represent what happens to the ink, after the time scale written below each diagram. **3 marks**



NO UV LIGHT



5 SECONDS OF UV LIGHT



15 SECONDS OF UV LIGHT

# PHOTOCHROMIC INK - CONTINUED

LINK TO HELP AND INFORMATION

<https://www.technologystudent.com/joints/photchrom1.html>

4d. With the aid of a sketch / sketches and notes, describe a practical application of photochromic inks. **4 marks (sketch(s)) and 4 marks notes**

SKETCH / SKETCHES

NOTES

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# HYDROCARBON ENCAPSULATING POLYMERS

LINK TO HELP AND INFORMATION <https://www.technologystudent.com/joints/hydrocab1.html>

1. Write a brief description of Hydrocarbon Encapsulating Polymers. **2 marks**

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2. Describe a potential small scale use of HC polymers. Include a sketch. **4 marks**

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3. Why are HC Polymers safe? **2 marks**

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# HYDROCARBON ENCAPSULATING POLYMERS - CONTINUED

LINK TO HELP AND INFORMATION <https://www.technologystudent.com/joints/hydrocab1.html>

4. An oil tanker runs aground and it's hull is damaged. Crude oil begins to leak into the sea, threatening the environment. How could HC Polymers help in this situation? *4 marks*

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5. Using notes and sketches, describe another potential use of HC Polymers. **3 marks**  
*(notes) 3 marks (sketch)*

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