

**Thursday 26 January 2012 – Morning**

**GCSE APPLIED SCIENCE: DOUBLE AWARD J649**

**B482/01** Unit 2: Science for the needs of society (Foundation Tier)

Candidates answer on the Question Paper.  
A calculator may be used for this paper.

**Duration: 1 hour**

**OCR supplied materials:**  
None

**Other materials required:**

- Pencil
- Ruler (cm/mm)



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**INSTRUCTIONS TO CANDIDATES**

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

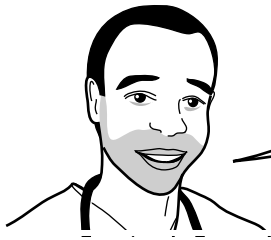
**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- The marks allocated and the spaces provided are a good indication of the length of answers required.
- This document consists of **20** pages. Any blank pages are indicated.

Answer **all** the questions.

1 Mary plans to go on holiday to Egypt.

She talks to a nurse about the health risks.



**Nurse**  
One of the most serious diseases in Egypt is typhoid. It is caused by bacteria. You will be at risk of catching typhoid on holiday.

(a) Suggest **two** ways that Mary could catch typhoid.

1. ....

2. .... [2]

(b) Typhoid is caused by bacteria.

The nurse tells Mary that she should have a vaccination against typhoid.

Complete the sentences to explain how vaccination works.

Choose words from this list.

- active**
- allergic**
- antibodies**
- dead**
- immune**
- live**
- microorganisms**

The vaccination contains ..... bacteria.

Mary's body makes .....

Several days after the vaccination, Mary is ..... to typhoid. [3]

(c) The nurse tells Mary that typhoid can cause a fever.

This happens when the bacteria travel around the body in the blood.

(i) People who have typhoid fever can be treated with antibiotics.

How do antibiotics work?

.....  
..... [1]

(ii) Which two of the following parts of the body transport blood?

Put ticks (✓) in **two** boxes next to the correct parts.

- arteries
- bronchi
- capillaries
- diaphragm
- nerves

[2]

(iii) The fever causes body temperature to increase.

What is normal body temperature?

Put a ring around the correct answer.

- 25 °C      27 °C      30 °C      37 °C      40 °C      45 °C      100 °C      [1]

(d) Which other health problems are caused by microorganisms?

Put a tick (✓) in the box next to the **two** correct answers.

- asthma
- cystic fibrosis
- diabetes
- measles
- mumps

[2]

[Total: 11]

2 Molecules in crude oil contain carbon.

(a) The diagram shows a carbon atom.

Complete the labels on the diagram.

Choose from these words.

electrons

elements

ions

molecules

neutrons

protons

..... are very light.  
They travel around the outside of  
the atom.

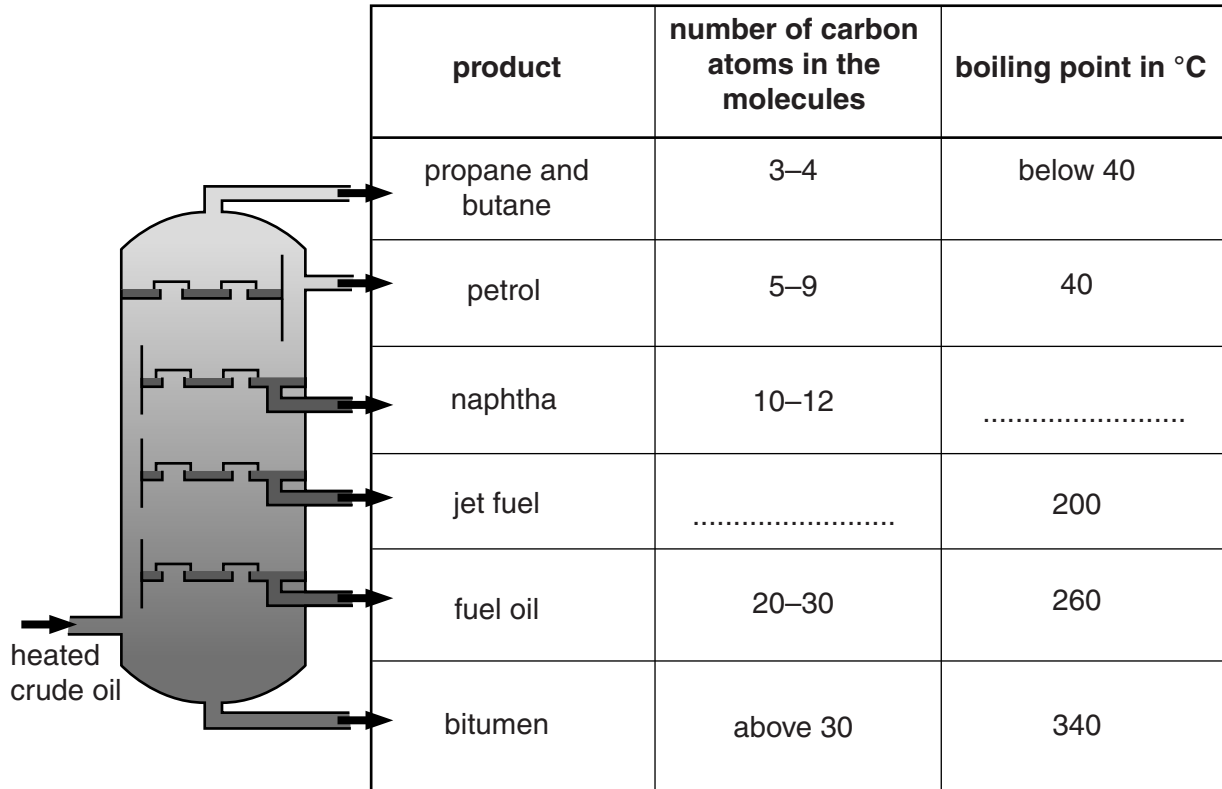
..... and  
.....  
are small and heavy. They  
are in the nucleus.

[2]

(b) Crude oil is separated into useful products.

The products can be separated because the molecules have **different numbers of carbon atoms** and **different boiling points**.

The diagram shows the process that separates crude oil.



(i) What is the name for this process?

Put a ring around the correct answer.

**electrolysis**      **filtration**      **fractional distillation**      **polymerisation**      [1]

(ii) Complete the table by filling in

- the **number of carbon atoms in jet fuel**
- the **boiling point for naphtha**.

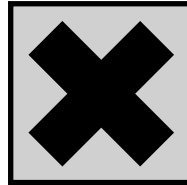
[2]

(c) All of the fuels are very hazardous because they are toxic and flammable.

The workers have to work to very strict safety rules.

(i) Which of the following symbols means **flammable**?

Put a **ring** around the correct answer.



[1]

(ii) Suggest **two** safety rules that the workers should follow when they are working near the fuels.

1. ....

2. .... [2]

(d) Crude oil can also be used to make products other than fuels.

Which of the following products can be made from crude oil?

Put a tick (✓) in one box in each row.

products	can be made from crude oil (✓)	cannot be made from crude oil (✓)
plastics		
salt		
dyes		
marble		
paints		

[2]

[Total: 10]

3 (a) Electromagnetic radiation is very useful for communications.

Draw a straight line to connect each type of **electromagnetic radiation** to the **communication system** it is used for.

**electromagnetic radiation**

**communication system**

visible light

mobile phones

microwaves

fibre optics

infrared

speech

remote controls

[3]

(b) Complete the diagram of the electromagnetic spectrum with the missing types of electromagnetic radiation.

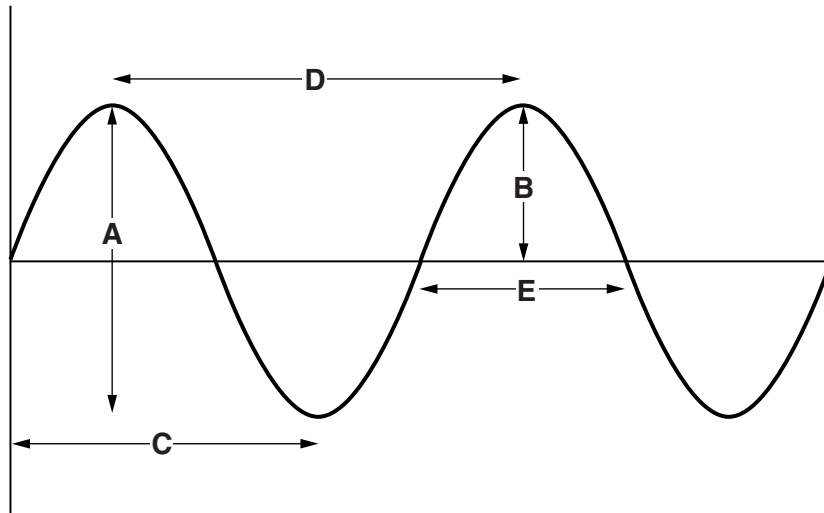
gamma	.....	.....	visible light	infrared	.....	radio
-------	-------	-------	---------------	----------	-------	-------

[2]

(c) All types of electromagnetic radiation are waves.

The waves have different frequencies and wavelengths.

This is a diagram of a wave.



(i) Which label, **A**, **B**, **C**, **D** or **E**, shows the wavelength of a wave? ..... [1]

(ii) What is meant by frequency?

.....  
 ..... [2]

(iii) Which type of electromagnetic radiation has ...

... the longest wavelength? .....

... the highest frequency? .....

[2]

[Total: 10]



4 Amy buys a bread making machine.

The bread making machine uses 3 stages for making a loaf of bread.

stage	temperature	time in minutes	action
1	room temperature (20 °C)	30	mixing the yeast with the other ingredients
2	35 °C	90	keeping the mixture warm with more mixing and resting
3	180 °C	60	baking the bread

(a) (i) The mixture is kept warm for 90 minutes during stage 2.

Explain what happens in the mixture during this time.

.....  
 ..... [2]

(ii) What happens to the yeast during stage 3?

..... [1]

(b) Amy looks at a recipe to make a loaf of bread.

**ingredients**

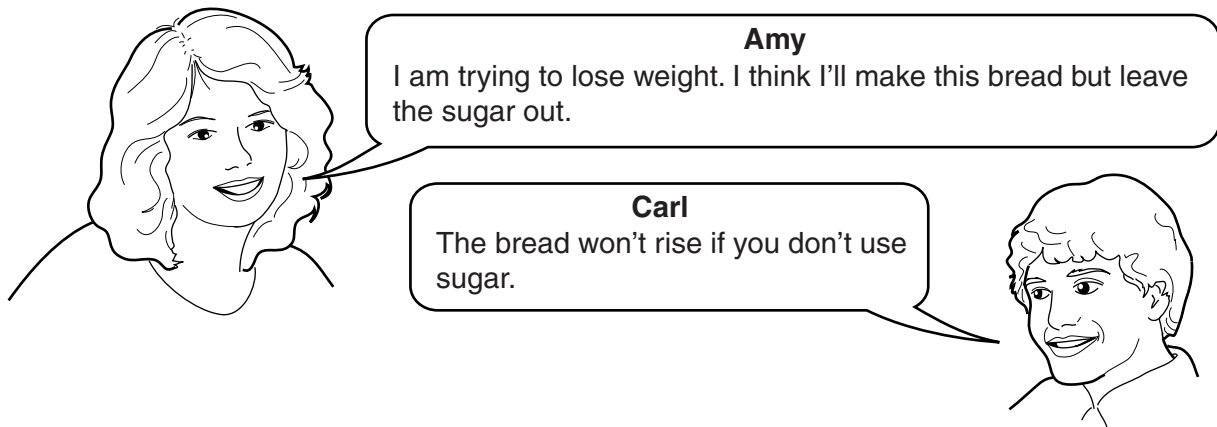
1 cup of water

3 cups of flour

3 tablespoons of sugar

2 teaspoons of dried yeast

She talks about the recipe with her friend, Carl.



Explain why sugar is needed to make the bread rise.

..... [1]

(c) The process that makes bread rise can also be used to make other products.

(i) What is the name of the process that makes bread rise?

Put a **ring** around the correct answer.

**distillation      fermentation      fertilisation      photosynthesis      [1]**

(ii) Which two other products are made using the same process?

Put ticks (✓) in the boxes next to the **two** correct products.

- beer
- cheese
- orange juice
- salt
- sugar

[2]

(d) Wheat for making bread flour can be grown on organic or intensive farms.

Which of the following statements are **true** for each type of farming?

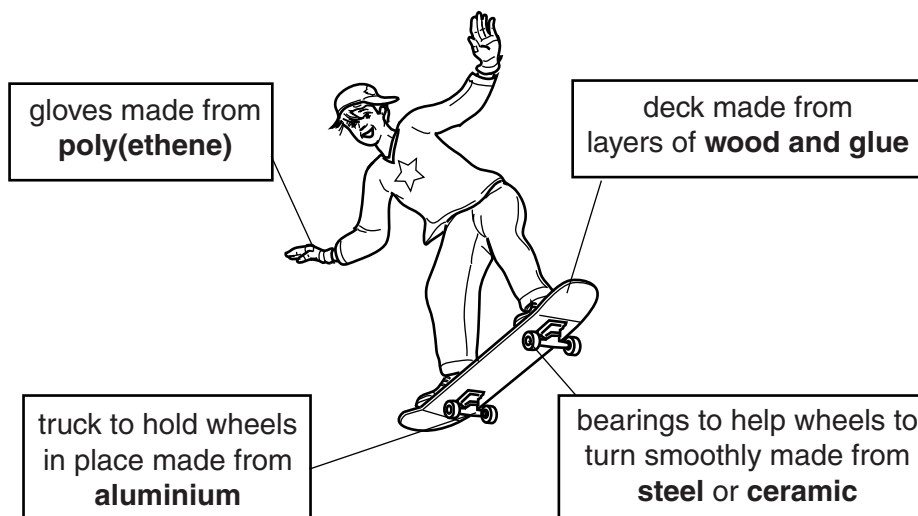
Put a tick (✓) in one box in each row.

<b>statement</b>	<b>true for organic farming (✓)</b>	<b>true for intensive farming (✓)</b>
uses only predators to kill pests		
uses artificial fertiliser		
more food produced on the same land area		

[2]

[Total: 9]

5 Skateboards and skateboard clothing are made from different materials.



(a) From the substances named on the diagram, give the name of...

(i) ....a **polymer**.

.....

[1]

(ii) ....an **element** that conducts electricity.

.....

[1]

(b) The deck of the skateboard is made of a composite material.

Which of the following statements about composite materials are true and which are false?

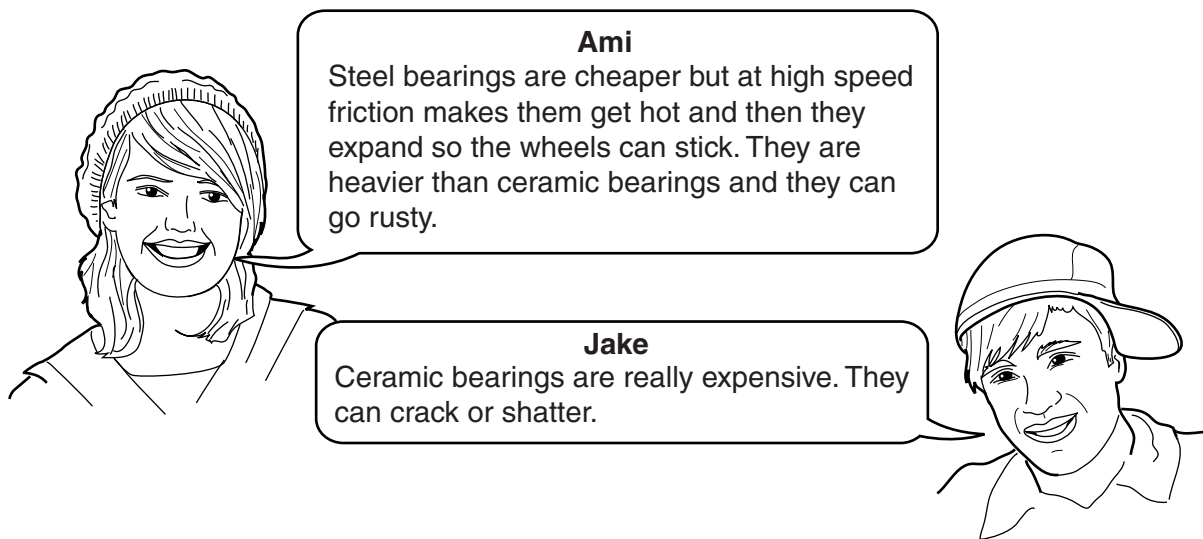
Put a tick (✓) in one box in each row.

	true (✓)	false (✓)
all the atoms in a composite are the same		
one example of a composite is glass reinforced plastic		
the properties of a composite are a combination of the properties of the materials used to make it		
materials used to make composites are always arranged in layers		

[2]

(c) Bearings help the wheels on skateboards go round smoothly.

Two friends are talking about the disadvantages of steel bearings and ceramic bearings.



(i) Use the information to explain the **advantages** of using ceramic bearings instead of steel.

.....

.....

..... [2]

(ii) Jake says that ceramics can crack or shatter.

What other properties do ceramics have?

Put ticks (✓) in the boxes next to the **two** correct answers.

- can be drawn into wires
- conduct electricity
- do not melt when heated
- flexible
- hard

[1]

(iii) One of the ceramics used in skateboards is called Cerbec.

Which of the following are also ceramics?

Put rings around the **two** correct answers.

**glass          ionic          cement          melamine          nylon          [2]**

(d) Ami has an old skateboard. She thinks the materials used to make the skateboard should be recycled.

Give one **disadvantage** of recycling the materials in old skateboards.

.....  
..... [1]

**[Total: 10]**

6 Joan is training to be a technician working at a laboratory that studies the Earth's atmosphere.

(a) Some of the main gases in the atmosphere are very important for living things.

Which of the main gases in the atmosphere...

(i) ...is needed for aerobic respiration? ..... [1]

(ii) ...keeps the Earth warm? ..... [1]

(iii) ...makes up most of the atmosphere? ..... [1]

(b) Joan monitors changes to the atmosphere that are caused by human activity.

She monitors some gases emitted by cars and by power stations.

Put a ring around **two** gases she might monitor.

argon

carbon monoxide

methane

nitrogen

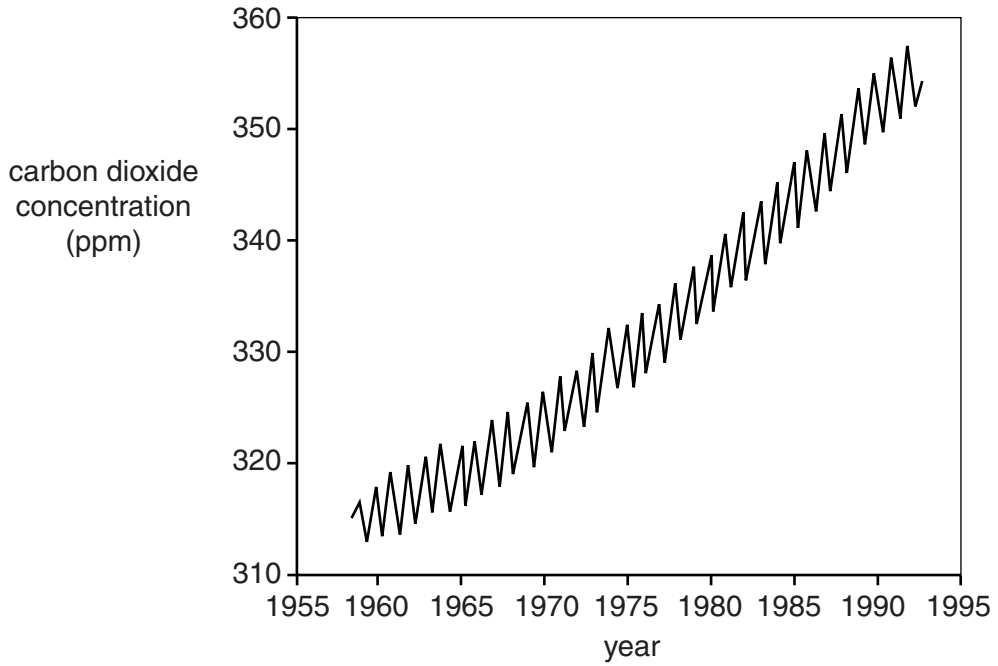
oxygen

sulfur dioxide

[2]

(c) Joan has data on carbon dioxide concentrations in the atmosphere.

She plots the data on a graph.



(i) Describe the **overall trend** shown by the graph.

.....

.....

..... [2]



- (ii) The graph also shows small variations of carbon dioxide during each year, when the carbon dioxide concentration goes up and down.

Suggest an explanation for this variation during each year.

.....  
.....  
..... [2]

- (d) Scientists have been able to find out the concentration of carbon dioxide in the atmosphere over the last 100 **thousand** years.

What method did they use?

Put a tick (✓) in the box next to the correct method.

looking at temperature records

measuring the amount of oxygen and assuming the rest was carbon dioxide

examining ice cores

examining igneous rocks

[1]

[Total: 10]

END OF QUESTION PAPER

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