Integrated Science – General Year 12 2017

## Task 6 – Unit 4

**Assessment Type:** Extended Response

**Conditions**

Period allowed for completion of the task:

* 1 week research and discussion in class
* 60 minutes to respond to questions in class under invigilated conditions

**Task weighting :** 15% **Due Date: Score : /40**

The chemical and physical properties of substances play a vital role in what the substance is used for.

Some chemical properties include:

* Flammability
* Chemical stability
* Toxicity
* Types of chemical bonds that will form

Some physical properties include:

* Appearance
* Texture
* Colour
* Odour
* Conduction of electricity and heat
* Solubility
* Density
* Melting point
* Boiling point
* Hardness
* Brittleness
* Ductility
* Malleability

**Elements of the task:**

**Part A:** Research 10% of total mark.

Research the chemical and physical properties of the materials provided and make succinct notes in the table provided. Study your notes to prepare as these will not be allowed whilst conducting Part B.

**Part B:** IN-class Assessment 90% of total mark.

In-class assessment that will include questions, based on your research, which will allow you to show your understanding of the chemical and physical properties of the materials provided.

|  |  |
| --- | --- |
| Material | Chemical and Physical Properties |
| eggs |  |
| Plastic |  |
| Iron |  |
| Yeast |  |
| Diamond |  |
| Teflon |  |
| Rubber |  |
| Cotton |  |
| Stainless steel |  |
| Leather |  |
| Flour |  |
| Gold |  |

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## Task 6 – Unit 4

**Assessment Type:** Extended Response

**Conditions**

* 60 minutes to respond to questions in class under invigilated conditions

**Task weighting :** 15%

**Name: Date: Score:** Notes /4

Written /36

**Total /40**

**Questions**

You work for a new design company and your boss has asked you to design a number of objects using the materials you have researched. The boss has given you a number of specifications for each object that must be followed.

Your task is to state which material(s) you would choose for each object and give two detailed reasons that explain your choice of material(s) based on its chemical and physical properties.

Object 1: Frypan **(6 Marks)**

When designing your frypan, you need to think about

1. Base of the frypan
2. Handle of the frypan

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Object 2: Thermos **(9 Marks)**

Your thermos must keep hot drinks, soups etc hot for long periods of time, you must also be able to touch it without burning yourself on the outside and it must be strong enough to be reused.

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Object 3: Water bottle and a holder for it.**(6 Marks)**

Your water bottle must be strong so that it doesn’t break when dropped; it needs to be light so that it can be taken on long walks without weighing the person down. Your holder must wrap around the bottle and have a strap so that it can be carried easily.

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Object 4: Wedding ring **(3 Marks)**

The band of your ring must be strong enough so that it is not damaged when it is worn.

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Object 5: Belt **(6 Marks)**

When designing your belt, you need to think about the following

1. The buckle on your belt
2. The strap of the belt

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Object 6: A loaf of bread **(6 Marks)**

When designing your loaf of bread you need to think about what ingredients you will choose and why you would choose those specific ingredients.

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**Part A : Marking criteria for notes**

Each material is worth 1 Mark

to get that 1 Mark the students need a minimum of 4 dot points about the properties of that material (less than 4 no marks)

**DIVIDE BY 3 TO GET A MARK OUT OF 4**

**Part B: In-class assessment- Answers**

You work for a new design company and your boss has asked you to design a number of objects using the materials you have researched. The boss has given you a number of specifications for each object that must be followed.

Your task is to state which material(s) you would choose for each object and give two detailed reasons that explain your choice of material(s) based on its chemical and physical properties.

Object 1: Frypan **(6 Marks)**

When designing your frypan, you need to think about

1. Base of the frypan
2. Handle of the frypan

Base 🡪 3 Marks Handle🡪 3 Marks

The three marks are as follows:

1 mark for stating an appropriate material (there are a number of correct options)

1 Mark for 2 reasons of the choice of material

1 Mark for explanation of both reasons.

EXAMPLE

The base of the frypan will be made with Teflon, (1 Mark) this is because Teflon is a good conductor of heat and has a high melting point (1 Mark) which means that the heat from the stove will be easily transferred to the material to allow for food to be cooked and it will not melt with the temperatures of the stove. (1 Mark)

Object 2: Thermos **(9 Marks)**

Your thermos must keep hot drinks, soups etc hot for long periods of time, you must also be able to touch it without burning yourself on the outside and it must be strong enough to be reused.

Inside material 🡪 3 Marks (conductor) middle material (insulator)🡪 3 Marks

Outside material🡪3 Marks ( insulator/ strong and hardy)

The three marks are as follows:

1 mark for stating an appropriate material (there are a number of correct options)

1 Mark for 2 reasons of the choice of material

1 Mark for explanation of both reasons.

Object 3: Water bottle and a holder for it.**(6 Marks)**

Your water bottle must be strong so that it doesn’t break when dropped; it needs to be light so that it can be taken on long walks without weighing the person down. Your holder must wrap around the bottle and have a strap so that it can be carried easily.

Water bottle🡪 3 Marks Holder🡪 3 Marks

The three marks are as follows:

1 mark for stating an appropriate material (there are a number of correct options)

1 Mark for 2 reasons of the choice of material

1 Mark for explanation of both reasons.

Object 4: Wedding ring **(3 Marks)**

The band of your ring must be strong enough so that it is not damaged when it is worn.

Band of the ring only if students talk about additional diamonds in ring no marks (band could be made out of diamonds)

The three marks are as follows:

1 mark for stating an appropriate material (there are a number of correct options)

1 Mark for 2 reasons of the choice of material

1 Mark for explanation of both reasons.

Object 5: Belt **(6 Marks)**

When designing your belt, you need to think about the following

1. The buckle on your belt
2. The strap of the belt

Buckle🡪 3 marks Strap🡪 3 Marks

The three marks are as follows:

1 mark for stating an appropriate material (there are a number of correct options)

1 Mark for 2 reasons of the choice of material

1 Mark for explanation of both reasons.

Object 6: A loaf of bread **(6 Marks)**

When designing your loaf of bread you need to think about what ingredients you will choose and why you would choose those specific ingredients.

Flour 🡪 3 Marks Yeast 🡪 3 Marks

The three marks are as follows:

1 mark for stating an appropriate material (there are a number of correct options)

1 Mark for 2 reasons of the choice of material

1 Mark for explanation of both reasons.