

# Home Learning Tasks



Your home learning tasks have been split into four main sections. It is entirely up to you in which order you complete these. They are designed to revisit some of the key Scientific skills you have used in your lessons this year. This means that some of the experiments you are asked to work on may be unfamiliar – Please don't be put off by this as we are looking for the skills.

If you can, we would like you to send any completed work to us through Show My Homework. Please don't worry if you can't; keep hold of it until we return to school.

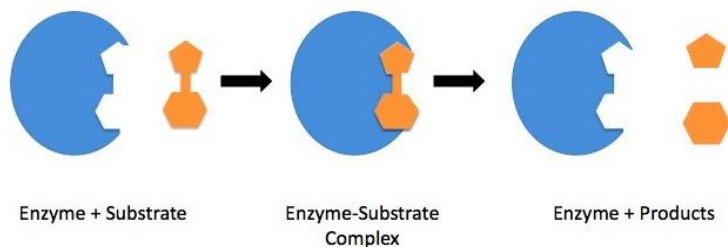
Science in Action	Application of Science	Recall of knowledge: Choose 1	Widening Your Scientific Mind
<p>We want you to get creative for this section! We will provide you with a method for an experiment you can complete at home. Use the planning sheets to record what you did and what you found out.</p> <p>If you want a real challenge, you could design your own investigation altogether! Use the blank planning sheet to help you structure your ideas.</p>	<p>For this task, you will have to read information around a key area of Science. This is where we are looking for you to develop your Scientific skills and will be given a list of criteria for the work that you produce.</p>	<p><b>Option One:</b> An Educake quiz will be set over the 3 weeks for you to complete. Decide how many you think you need to get right – 50%? 75%? 100%?</p> <p><b>Or</b></p> <p><b>Option Two:</b> How much can you remember on digestion – answering some practice questions.</p>	<p>These tasks will help to understand the Science in the real world. We would like you to watch, read or discover some new Science and will provide you with some stimulus material to look at.</p> <p>You will be given <b>two</b> options and you we'd like you to complete at least <b>one</b>.</p>

**For Year 8 - Wb 1<sup>st</sup>, 8<sup>th</sup> and 15<sup>th</sup> June**

# Biology Home Learning Project 1 – Food and Digestion

## Section One – Science in Action

Enzymes are proteins that speed up chemical reactions (breaking down larger molecules into smaller ones).



You are investigating how the size (surface area) effects how fast the enzyme **amylase** (found in saliva) breaks down bread.

Fill in the boxes:

### **Independent variable**

I will change: \_\_\_\_\_

### **Dependent variable (what the results depend on/record in the results table)**

I will measure: \_\_\_\_\_

Using a \_\_\_\_\_

### **Control variable**

I will keep these the same:

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

This is because \_\_\_\_\_

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

**Write a step by step method describing how you would do the investigation.**

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

Carry out the practical:

- **Measure out 5 different sizes of bread - MAKE SURE YOU HAVE ADULT SUPERVISION WHEN CUTTING THE BREAD.**
- **Time how long it takes for the bread to disintegrate (break up) in your mouth.**

**Basic - Run the investigation once and record the results.**

**Intermediate - Run the investigation 3 times and calculate the average (add the rows up and divide by 3).**

**Challenge: Are there any anomalies? If so how can you tell?**

Size of the bread (mm)	Time taken for the bread to disintegrate (seconds)			
	Trial 1	Trial 2	Trial 3	Average

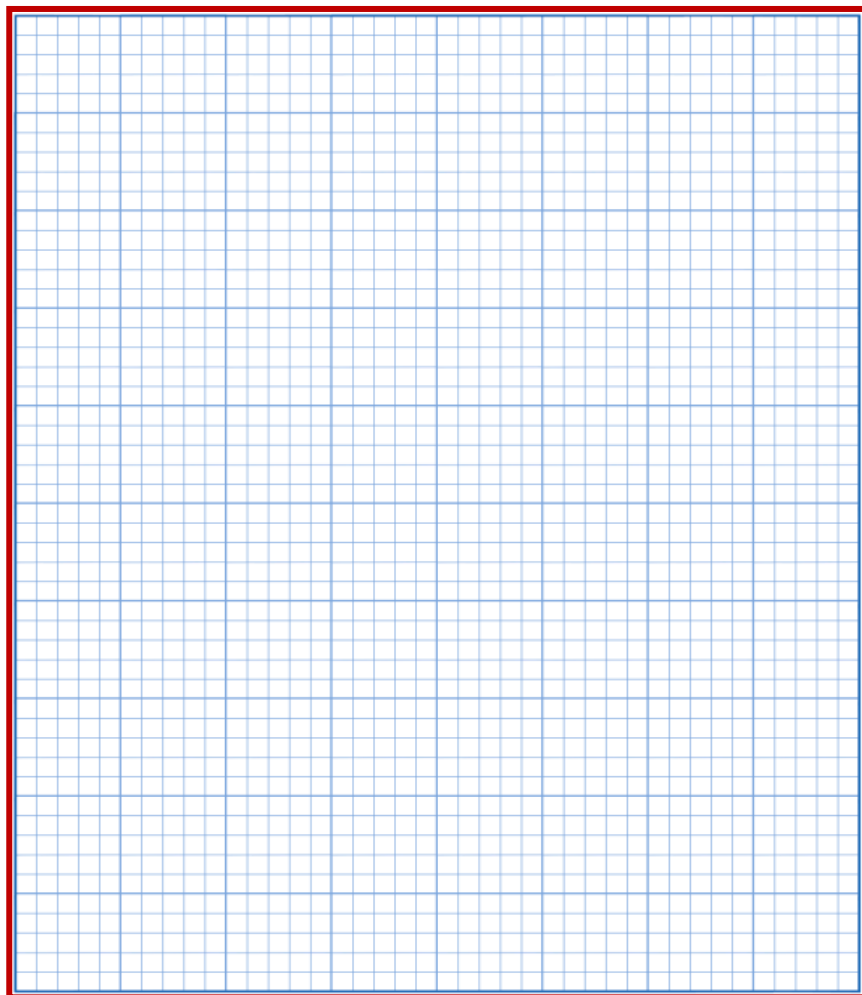
**Challenge:**

**Suggest 3 ways that you could improve the investigation.**

I could improve the investigation by ...

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**Super challenge:** Plot your results on the graph paper and draw a line of best fit.



Conclusion:

What did you find? Use your graph to give extra detail.

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Explain how you know this.

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Any observations, did you taste a difference in the bread?

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## The journey of a cheese sandwich

### Task:

You must explain the journey of a cheese sandwich through your digestive system.

You can choose to explain your ideas through either:

- writing a story;
- drawing a cartoon.






### Top tips:

- Choose a level to work on.
- Include as many key words as you can: **Green - Level 1**, **Amber – Level 2**, **Red - Level 3**.

**Key words:** **absorption**, **anus**, **carbohydrate**, **digestion**, **oesophagus**, **protease**, **fat**, **small intestine**, **peristalsis**, **bile**, **pancreas**, **salivary gland**, **amino acids**, **glucose**, **soluble/insoluble**, **fatty acid**, **faeces**, **amylase**, **hydrochloric acid**, **large intestine**, **lipase**, **glycerol**, **liver**, **mouth**, **protein**, **stomach**, **villi**, **teeth**, **diffusion**,

Choose one level to focus on, try to challenge yourself ...

	<ul style="list-style-type: none"><li>• Named most of the organs of the digestive system, using key words.</li><li>• Described what happens to the food in each organ.</li><li>• Named the food groups in the cheese sandwich.</li><li>• Explained why the body needs food.</li></ul>
	<ul style="list-style-type: none"><li>• Named all of the organs of the digestive system in order.</li><li>• Shown knowledge of the position of the major organs in the body.</li><li>• Explained what happens to the food in each organ.</li><li>• Described why the body needs each of the food groups.</li><li>• Described simply how enzymes are involved with digestion.</li><li>• Explained how food is absorbed in the small intestine in terms of solubility and adaptations.</li></ul>
	<ul style="list-style-type: none"><li>• Described in detail all of the organs of the digestive system.</li><li>• Shown knowledge of the shape and position of the major organs in the body.</li><li>• Explained in detail what happens to the food in each organ, naming specific enzymes and products.</li><li>• Explained why the body needs each of the food groups.</li><li>• Explained how food is digested, absorbed and transported to the cells.</li><li>• Discussed some of the adaptations of the small intestines for food absorption.</li></ul>

## **Section Three – Application of Science**

### **Either**

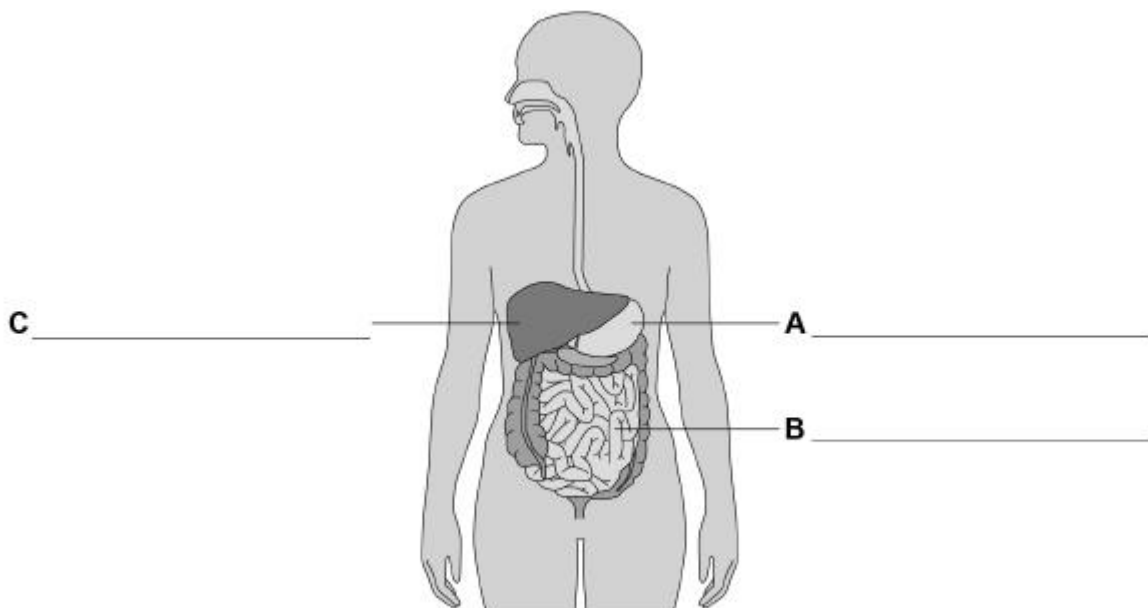
Go to [www.educake.co.uk](http://www.educake.co.uk) and enter the username and password you were given. If it doesn't work and you are unable to reset it yourself, email [pschuller@stocksbridgehigh.co.uk](mailto:pschuller@stocksbridgehigh.co.uk) and you will be given instructions on what to do next.



1. Decide how many you think you need to get right before you start. Are you aiming for 50%, 75% or even 100%? If you don't reach your target first time, that's okay as you can retake the quiz as many times as you like.
2. If you don't agree with the way that Educake has marked your answer, you can disagree with the mark. Pressing this will ask your teacher to check and decide whether your answer is indeed correct or whether it still needs a little bit of work. Make sure you check back regularly to see whether you have received some feedback
3. If you want to set yourself a real challenge; you can set yourself your own quiz to complete. Try setting yourself 10 random questions from a topic you have covered this year. If you are unsure, email your Science teacher with your name and class and they will be able to help you out.

### **Or answer one of the exam questions below (1 star easier, 2 star harder)**

**Q1.** The diagram below shows the human digestive system.



(a) Label organs **A**, **B** and **C**.

(3)

(b) Complete the sentences.

Choose the answers from the box.

<b>excreted</b>	<b>denatured</b>	<b>digest</b>	<b>speed up</b>
<b>slow down</b>	<b>ingested</b>	<b>insoluble</b>	<b>soluble</b>

Digestion is the process of breaking down large food molecules into smaller molecules that are \_\_\_\_\_ .

Enzymes help to break down food because they \_\_\_\_\_ chemical reactions. If the temperature of an enzyme gets too high, the enzyme is \_\_\_\_\_ .

(3)

(c) Protease is an enzyme. Protease breaks down protein.

What is protein broken down into?

Tick **one** box.

Amino acids

☐

Fatty acids

☐

Glucose

☐

Glycerol

☐

(1)

(d) Why is protein needed by the body?

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(1)

(e) Which organ in the human digestive system produces protease?

Tick **one** box.

Gall bladder ☐

Large intestine ☐

Liver ☐

Stomach ☐

(1)

(g) Complete the sentence. Choose the answer from the box.

<b>fat</b>	<b>fibre</b>	<b>minerals</b>	<b>vitamins</b>
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Obesity can be caused by a diet high in \_\_\_\_\_ . (1)

(h) Complete the sentence. Choose the answer from the box.

<b>skin cancer</b>	<b>type 1 diabetes</b>	<b>type 2 diabetes</b>
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Obesity is a risk factor for \_\_\_\_\_ .(1)

(Total 11 marks)



**Q2.** Catalase is an enzyme.

Catalase controls the following reaction:



A student did an investigation on catalase activity.

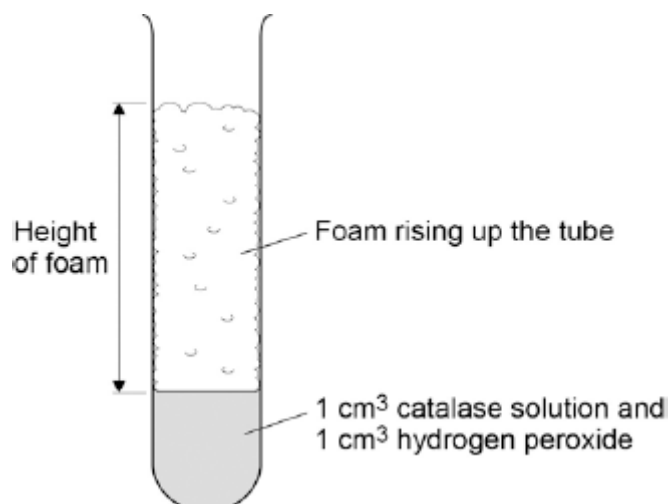
This is the method used.

1. Put 1 cm<sup>3</sup> hydrogen peroxide solution in a test tube.
2. Add 1 cm<sup>3</sup> of catalase solution.
  - Bubbles of oxygen are produced.
  - Bubbles cause foam to rise up the tube.



3. Measure the maximum height of the foam.

The diagram below shows the experiment.



The experiment is carried out at 20 °C. The table shows the results.

Temperature in °C	Maximum height of foam in cm			
	Test 1	Test 2	Test 3	Mean
10	1.3	1.1	0.9	1.1
20	0.0	3.3	3.1	3.2
30	5.2	5.0	5.3	5.2
40	4.2	3.5	4.4	4.0
50	2.1	1.9	2.3	2.1
60	0.0	0.0	0.0	0.0

(a) Why did the student carry out the experiment three times at each temperature? Tick **one** box.

To make the experiment more accurate

☐

To prove the experiment was correct

☐

To show the experiment was more repeatable

☐

(1)

- (b) The student thought one result was an anomaly.

Circle the anomaly in the table above.

(1)

- (c) What did the student do with the anomalous result?

\_\_\_\_\_

\_\_\_\_\_ (1)

- (d) Look at the table above.

What conclusion can be made as the temperature increases?

Tick **one** box.

Decreases the rate of reaction up to 30 °C

☐

Decreases the rate of reaction up to 40 °C

☐

Increases the rate of reaction up to 30 °C

☐

Increases the rate of reaction up to 40 °C

☐

(1)

- (e) At which temperature was catalase denatured?

Tick **one** box.

10 °C

☐

30 °C

☐

40 °C

☐

60 °C

☐

(1)

- (f) The student thought the optimum temperature for catalase activity was between 30 °C and 40 °C.

How could the investigation be improved to find a more **precise** value for the optimum temperature?

Tick **one** box.

Do the experiment at 70 °C and 80 °C

☐

Do the experiment at 30 °C, 35 °C and 40 °C

☐

Use less hydrogen peroxide solution

☐

Use more catalase solution

☐

(1)

- (g) Amylase is the enzyme that controls the breakdown of starch to glucose.

Describe how a student could investigate the effect of **pH** on the breakdown of starch by amylase.



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## **Section Four – Widening your Scientific Mind**

### **Either**

#### **Watch The Secret of Your Food: We are what we eat**

<https://www.youtube.com/watch?v=23EMDivtnEE>

Create a poster/presentation or a leaflet to summarise the key nutrients that we need to live healthily.

You may want to include:

- Information on the source of key nutrients, uses in the body and what they are made up of.
- Yeast is a single celled organism, when it respire, what does it produce?
- How many essential amino acids are there?
- What do we mean by lactose intolerance, why is it a problem for our health – how is this overcome? What role do enzymes play in this?
- What are the key vitamins and their uses?



Keep a diary of everything that you eat and drink for 3 days.

Look back at your food diary and think about how healthy your diet is. Do you think you are getting the right amount of nutrients for your lifestyle? Think about all of the activities that you do that need extra energy.

**Or**

Design a new healthy balanced meal plan for yourself. Think about each of the food groups carefully and when you might need extra energy. How can your new plan support this?