STOKE DAMEREL

Aspire Achieve Thrive

## Half Term 1

# Triple Science

## Year 10

**Name: _____**

**Tutor: _____**

**Tassomai - 2 Daily Goals per week - Deadline is Friday**

# Year 10 Homework Timetable

| | | | | |
|---|---|---|---|---|
| **Monday** | English | Ebacc Option A | Option C | |
| **Tuesday** | Tassomai | Option B | Modern Britain | |
| **Wednesday** | Sparx | Science | Option C | |
| **Thursday** | Ebacc Option A | Tassomai | Option B | Modern Britain |
| **Friday** | Sparx | Science | English | |

**Tassomai - 2 Daily Goals per week**
**Sparx - 4 tasks of Sparx per week**

| Option A (EBACC) |
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| French |
| Geography |
| History |

| Open B |
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| Art |
| Business Studies |
| Catering |
| Computer Science |
| History |
| Health & Social Care |
| Music |
| Sport |
| IT |

| Open C |
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| Business Studies |
| Childcare |
| Catering |
| Drama |
| Geography |
| Health & Social Care |
| Triple Science |
| Sport |

**Year 10 Triple Science - Homework Plan Science**

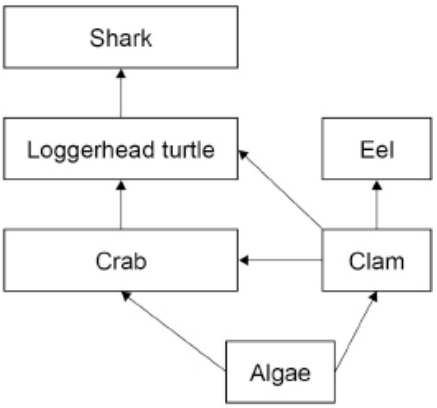
| Week/Date | Homework Task | Examination Question |
|---|---|---|
| Week 1<br>5th September | **Cornell Notes** on biotic and abiotic factors affecting ecosystems | Answer the exam questions on food webs. |
| Week 2<br>12th September | **Revision Cards** on pyramids of biomass. | Answer the exam questions on pyramids of biomass |
| Week 3<br>19th September | **Cornell Notes** on food security | Answer the exam questions on losing biomass and food security. |
| Week 4<br>26th September | **Revision Cards** on alkali metals | Answer the exam questions on Alkali metals |
| Week 5<br>3rd October | **Cornell notes** on the transition elements | Answer the exam questions on transition elements |
| Week 6<br>10th October | **Revision Cards** on nanoparticles and their uses. | Answer the exam questions on nanoparticles |
| Week 7<br>17th October | **Cornell Notes** on red shift | Answer the exam questions on the formation of stars |

| Biology | | Chemistry | | Physics | |
|---|---|---|---|---|---|
| Keyword | Definition | Keyword | Definition | Keyword | Definition |
| Biomass | The total mass of one animal or plant species in a food chain or food web | Alkali metals | The very reactive metals found in group 1 or the periodic table such as sodium and potassium. | Big bang theory | The theory of how the universe began stating that it expanded from a single point. |
| Trophic level | These describe the position of an organism in a food chain, web or pyramid. | Transition metals | An element in the middle section of the periodic table in between groups 2 and 3. | Natural satellite | An astronomical body that orbits a planet such as the Earth's moon. |
| Sustainable | The ability to provide for current generations without compromising future generations. | Nanoparticles | Very small particles found on the nanoscale that are too small to be seen with the naked eye. | Artificial satellite | A man-made body placed in orbit around the earth or another planet in order to collect information about it |
| Biotechnology | The alteration of living organisms to develop or make products that help us. | Physical properties | A property that can be measured without changing the chemical composition of a substance. Such as hardness. | Orbit | A regular, repeating path that one object in space takes around another one. |
| Producer | Organisms that make their own organic nutrients (food) - usually using energy from sunlight. | Chemical properties | A characteristic of a particular substance that can be observed in a chemical reaction. | Nebula | A huge cloud of dust and gas from which stars are formed. |
| Interdependence | The state of being dependent upon one another. It refers to all organisms in a food chain or web. | Bulk materials | Particles that have their size above 100 nm. They have different properties to their nanoparticle counterparts. | Protostar | A cloud of gas pulled together into a spherical volume by its own gravity, in which the compressed gas gets hotter and starts to glow. |
| Decomposer | Bacteria and fungi which break down dead organisms | Density | This is the mass per unit volume of a substance. | Nuclear fusion | When two nuclei of different atoms merge to form a single nucleus. |
| Overfishing | When more fish of a particular species are caught than can be replaced through natural reproduction. | Trend | The general direction in which something is developing or changing over time. | Equilibrium | A situation where there is no resultant force accruing on an object. The forces balance in magnitude and direction. |
| Regeneration | The natural process of replacing or restoring damaged habitats | Outer shell | The shell found furthest from the nucleus. The electrons on this shell determine the reactivity of an element. | Supernova | An exploding star caused when nuclear fusion stops in a star and when the star has a large enough mass. |
| Biodiversity | A measure of how many different species live in an ecosystem | Stability | When an atom's outer shell is either full or empty of electrons. | Wavelength | The distance between a point on one wave and the adjacent point on the next wave. |
| **Most Important Fact** | | | | | |
| Humans are becoming more aware of the importance of biodiversity and because of this there are many programmes being put in place to preserve biodiversity. These include breeding programmes, regeneration of rare habitats, reduction of deforestation and the reintroduction of hedgerows and field margins. | | Surface area to volume ratio is simply an object's surface area divided by its volume. Nanoparticles are more useful than their bulk material counterparts because they have a higher surface are to volume ratio meaning less of it is needed in order to be effective. | | Red shift is a result of the space between the Earth and the galaxies expanding. This expansion stretches out the light waves during their journey to us, shifting them towards the red end of the spectrum. Red shift is evidence that our universe is still expanding. | |

# WEEK 1

Date…….

The diagram below shows part of a food web.




(a) There are four levels of feeding relationship shown in the food web in the diagram above.

Algae are at level 1 in the food web.

Why is it difficult to identify the level of the loggerhead turtle in the food web?

_____ (1)

(b) Explain the effects a decrease in the population of clams could have on the other organisms in the diagram above.

Answer:-

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_____**(6)**

# WEEK 2

Date…….

A new dog food has been developed that does not contain meat from cows, sheep or chickens.

The new dog food contains insects.

The insects in the dog food factory are fed on waste vegetables.

(a) Sketch the pyramid of biomass for the food chain that produces food for dogs from insects.

Label the pyramid.

**(2)**

(b) Describe two reasons why the biomass of the insects eaten by dogs does not all become biomass of the dogs.

**1** _____

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**2** _____

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**(2)**

# WEEK 3

Date…….

Students investigated a food chain in a garden.

**lettuce → snail → thrush (bird)**

The students:

- estimated the number of lettuce plants in the garden
- estimated the number of snails feeding on the lettuces
- counted two thrushes in the garden in 5 hours.

The table below shows the students' results and calculations.

| Organism | Population size | Mean mass of each organism in g | Biomass of population in g | Biomass from previous organism that is lost in g | Percentage of biomass lost |
|---|---|---|---|---|---|
| Lettuce | 50 | 120.0 | 6000 | | |
| Snail | 200 | 2.5 | 500 | 5500 | 91 |
| Thrush | 2 | 85.0 | 170 | 330 | 66 |

(a) (i) Give **two** ways that biomass is lost along a food chain.

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**(2)**

Explain how making dog food from insects could improve human food security in the future.

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_____ **(4)**

# WEEK 4

Date…….

The elements in Group 1 of the periodic table are metals.

(a) The elements in Group 1 are called the alkali metals.

Why are they called the alkali metals?

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**(2)**

(b) Explain the increase in reactivity of elements further down the group.

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**(4)**

# WEEK 5

Date……

In the periodic table, the transition elements and Group 1 elements are metals.

Some of the properties of two transition elements and two Group 1 elements are shown in the table below.

| | Transition elements | | Group 1 elements | |
|---|---|---|---|---|
| | Chromium | Iron | Sodium | Caesium |
| **Melting point in °C** | 1857 | 1535 | 98 | 29 |
| **Formula of oxides** | $CrO$<br>$Cr_2O_3$<br>$CrO_2$<br>$CrO_3$ | $FeO$<br>$Fe_2O_3$<br>$Fe_3O_4$ | $Na_2O$ | $Cs_2O$ |

Use your own knowledge and the data in the table above to compare the chemical and physical properties of transition elements and Group 1 elements.

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(6)

Date…….

Read the article about the use of nanoparticles in sun creams.

**Sun creams**

Many sun creams use nanoparticles. These sun creams are very good at absorbing radiation, especially ultraviolet radiation. Owing to the particle size, the sun creams spread more easily, cover better and save money because you use less. The new sun creams are also transparent, unlike traditional sun creams which are white. The use of nanoparticles is so successful that they are now used in more than 300 sun cream products.

Some sun creams contain nanoparticles of titanium oxide. Normal-sized particles of titanium oxide are safe to put on the skin.

It is thought that nanoparticles can pass through the skin and travel around the body more easily than normal-sized particles. It is also thought that nanoparticles might be toxic to some types of cell, such as skin, bone, brain and liver cells.

(a) Explain why nanoparticles pass through the skin and travel around the body more easily than normal-sized particles of titanium oxide.

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**(2)**

(b) Explain why sun creams containing nanoparticles should be tested further.

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**(1)**

(c) Suggest why some companies that make sun creams might not want to do more tests.

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**(2)**

# WEEK 7

Date…….

Astronomers claim that there are about 300 billion stars in the Milky Way.

(a) Describe how stars are formed.

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**(3)**

(b) Use the correct answer from the box to complete the sentence.

| decay | fission | fusion |
|---|---|---|

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Energy is released in stars by the process of nuclear _____ .

(1)

(c) State why a star is stable during the 'main sequence' period of its life cycle.

_____

_____

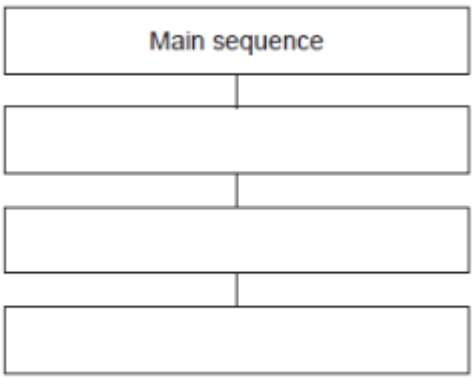
(1)

(d) The life cycle of a star after the 'main sequence' period depends on the size of the star.

A particular star is the same size as the Sun.

What are the stages, after the main sequence, in the life cycle of this star?

State them in order by writing in the boxes.

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## STEP 2: CREATE CUES

What: Reduce your notes to just the essentials.

What: Immediately after class, discussion, or reading session.

How:
- Jot down key ideas, important words and phrases
- Create questions that might appear on an exam
- Reducing your notes to the most important ideas and concepts improves recall. Creating questions that may appear on an exam gets you thinking about how the information might be applied and improves your performance on the exam.

Why: Spend at least ten minutes every week reviewing all of your previous notes. Reflect on the material and ask yourself questions based on what you've recorded in the Cue area. Cover the note-taking area with a piece of paper. Can you answer them?

## STEP 1: RECORD YOUR NOTES

What: Record all keywords, ideas, important dates, people, places, diagrams
and formulas from the lesson. Create a new page for each topic discussed.

When: During class lecture, discussion, or reading session.

How:
- Use bullet points, abbreviated phrases, and pictures
- Avoid full sentences and paragraphs
- Leave space between points to add more information later

Why: Important ideas must be recorded in a way that is meaningful to you.

## STEP 3: SUMMARISE & REVIEW

What: Summarise the main ideas from the lesson.
What: At the end of the class lecture, discussion, or reading session.
How: In complete sentences, write down the conclusions that can be made from the information in your notes.
Why: Summarising the information after it's learned improves long-term retention.

**Date** / / **Topic**

# WEEK 1

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# WEEK 7

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**Summary**

# Revision Page

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| Revision Card on Pyramids of Biomass | Answers |
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| 1. What is biomass?<br>2. What is a trophic level?<br>3. Evaluate the use of wet or dry biomass when building pyramids of biomass.<br>4. Explain the role of decomposers in a food chain.<br>5. Explain what happens to biomass as you move up the food chain. | |

| Revision Card on alkali metals | Answers |
| --- | --- |
| 1. Write a word equation for the reaction of sodium and water.<br>2. Explain why sodium floats on water.<br>3. Explain why group 1 elements lose electrons.<br>4. Explain the trend in reactivity of the alkali metals in terms of electron transfer. | |

| Revision Card on Nanoparticles and their uses | Answers |
| --- | --- |
| 1. Describe what a nanoparticle is.<br>2. Compare nano dimensions to the dimensions of atoms and molecules.<br>3. Identify two nanoparticles and their uses.<br>4. Evaluate the risks and benefits of using nanoparticles. | |