GCSE Science homework - triple Year 11 terms 3 & 4



The following tasks must be completed by the dates indicated:

Due date	Task
Friday 19 th January 2024	B5 – Genes and Inheritance
Friday 26 th January 2024	C5 - Monitoring and Controlling Chemical Reactions
Friday 2 nd February 2024	B6 - Sampling
Friday 9 th February 2024	C6 Global Challenges
Friday 23 rd February 2024	C6 Earth's Atmosphere
Friday 1 st March 2024	P7 Energy
Friday 8 th March 2024	P7 Energy 2
Friday 15 th March 2024	B6 Communicable Diseases
Friday 22 nd March 2024	B6 Feeding the Human Race
Friday 12 th April 2024	Working Scientifically

Due date:	Friday 19 th January 2024	
Student number:		
Name:		Academy
		Grammar

Y11 Triple T3 W2 – B5 – Genes and Inheritance

Question	Answer
What is a gene?	A section of DNA which codes for the synthesis of a
	protein e.g. for eye colour
What is an allele/variant?	A different version of a gene
	e.g. allele for blue eyes or an allele for brown eyes
What is a genotype?	The alleles which determine an organism's
	characteristics
What is a phenotype?	The physical appearance which results from genotype
How does a dominant allele affect	If a dominant allele is present in the genotype, it will be
phenotype?	expressed in the phenotype.
How do recessive alleles affect	Recessive alleles will only be expressed in phenotype
phenotype?	if no dominant alleles are present in the genotype.
What is the difference between	A homozygous genotype contains identical alleles.
homozygous and heterozygous	E.g. HH or hh.
genotypes?	A heterozygous genotype contains different alleles.
	E.g. Hh
What is the difference between	Diploid cells have the full number of chromosomes (46
haploid and diploid cells?	in humans) whereas haploid cells contain half the
	number of chromosomes (23 in humans)
What is a mutation?	A change in an organism's DNA
What is evolution?	A change in the inherited characteristics of a
	population over time, through a process of natural
	selection.

Question	Answer
What is a gene?	
What is an allele/variant?	
What is a genotype?	
What is a phenotype?	
How does a dominant allele affect	
phenotype?	
How do recessive alleles affect	
phenotype?	
What is the difference between	
homozygous and heterozygous	
genotypes?	
What is the difference between	
haploid and diploid cells?	

What is a mutation?	
What is evolution?	

Question	Answer
What is an allele/variant?	
	The physical appearance which results from genotype
How do recessive alleles affect	
phenotype?	
	Diploid cells have the full number of chromosomes (46
	in humans) whereas haploid cells contain half the
	number of chromosomes (23 in humans)
	A section of DNA which codes for the synthesis of a
	protein e.g. for eye colour
What is the difference between	
homozygous and heterozygous	
genotypes?	
What is a mutation?	
	If a dominant allele is present in the genotype, it will be
	expressed in the phenotype.
What is evolution?	
What is a genotype?	

Janice has cystic fibrosis. Cystic fibrosis is caused by a recessive allele (f). What is the probability of her baby having cystic fibrosis? The baby's father is heterozygous for cystic fibrosis.

Use a labelled genetic diagram to explain your answer (2)

Club thumb is another inherited condition. It is caused by a **dominant** allele (**T**). Janice has normal thumbs. The father is heterozygous. What is the probability of the baby having club thumbs?

Explain your answer. (2)

Due date:	Friday 26 th January 2024	
Student number:		
Name:		Trinity Academy
		Grammar

Y11 Triple T3 W3 C5 - Monitoring and Controlling Chemical Reactions

Question	Answer
How can rate of reaction be	By recording the change in mass or volume of reactants or
measured experimentally?	products over time
How could the rate of gas	Use a gas syringe to record the volume of gas, a stopwatch to
production be measured and	record time and then use rate = volume/time
calculated?	
What factors affect the rate of	Concentration (pressure in gases), temperature, surface area (of
a chemical reaction?	solids) and presence of a catalyst
What determines the rate of a	The frequency and energy of collisions between particles e.g. a
chemical reaction?	faster reaction has more frequent, successful collisions
How do catalysts speed up	They provide an alternative reaction pathway of lower activation
rates of chemical reactions?	energy and are not used up in the process
What is activation energy?	The minimum energy required for a reaction to start. The energy
	needed to break bonds in reactants.
What is a reversible reaction?	A chemical process which has both a forward and reverse
	reaction.
What is a dynamic equilibrium?	In a closed system, when the rates of the forward and backward
	reactions are equal.
What factors affect the position	Concentration, temperature and pressure.
of a dynamic equilibrium?	
What are compromise	A temperature and pressure which provide an acceptable yield
conditions?	at an acceptable rate of reaction: usually with a catalyst.

Question	Answer
What determines the rate of a	
chemical reaction?	
How do catalysts speed up rates of	
chemical reactions?	
What is activation energy?	
How can rate of reaction be	
measured experimentally?	
How could the rate of gas production	
be measured and calculated?	
What factors affect the position of a	
dynamic equilibrium?	
What are compromise conditions?	
What factors affect the rate of a	
chemical reaction?	
What is a reversible reaction?	

What is a dynamic equilibrium?	

Question	Answer
	Concentration (pressure in gases), temperature, surface
	area (of solids) and presence of a catalyst
What is a dynamic equilibrium?	
How can rate of reaction be measured	
experimentally?	
	A chemical process which has both a forward and
	reverse reaction
What determines the rate of a	
chemical reaction?	
How could the rate of gas production	
be measured and calculated?	
	A temperature and pressure which provide an
	acceptable yield at an acceptable rate of reaction:
	usually with a catalyst
What factors affect the position of a	
dynamic equilibrium?	
	They provide an alternative reaction pathway of lower
	activation energy and are not used up in the process
What is activation energy?	

1. A student investigates the decomposition of hydrogen peroxide.

 $2H_2O_2(aq) \rightarrow 2H_2O(l) + O_2(g)$

0.2g of oxygen gas is produced in the reaction. The student uses 0.5 g of manganese(IV) oxide as a catalyst in the reaction. How much manganese(IV) oxide remains at the end of the reaction?

A 0.2g

B 0.3g

- **C** 0.5g
- **D** 0.7g

Your answer

2. Which statement describes dynamic equilibrium?

- A Occurs in a closed system and the backward reaction is faster than the forward reaction.
- **B** Occurs in a closed system and the forward reaction is faster than the backward reaction.
- **C** Occurs in a closed system and the rates of the forward and backward reactions are equal.
- D Occurs in an open system and the rates of the forward and backward reactions are equal.

Your answer

3. The Contact process produces sulfur trioxide, SO₃, in an exothermic reaction.

 $2SO_2 + O_2 \leftrightarrows 2SO_3$

The temperature in the reaction vessel is usually 450 °C. What happens as the temperature is increased to 600 °C?

- A Higher rate of reaction and increased yield of sulfur trioxide.
- **B** Higher rate of reaction and decreased yield of sulfur trioxide.
- **C** Higher rate of reaction and no change in yield of sulfur trioxide.
- D Lower rate of reaction and decreased yield of sulfur trioxide.

[1]

[1]

Due date:	Friday 2 nd February 2024	
Student number:		Trinity
Name:		Academy
		Gramma

Y11 Triple T3 W4 B6 - Sampling

Question	Answer
What is random sampling used for?	To estimate the population of an organism in an area.
How do you prevent bias during	Use a random number generator to determine where
random sampling?	to place your quadrat.
What equipment is needed for a transect?	Quadrat, tape measure.
What could a transect be used for?	To see how plant species change as you move inland
	from the sea.
What is biodiversity?	The variety of living organisms in an area.
How are humans contributing to the	Deforestation, hunting and fishing, pollution.
loss of biodiversity?	
What methods can be used to	Captive breeding, protected habitats, hunting bans,
prevent further loss of biodiversity?	education, artificial ecosystems, seed banks.
How does captive breeding increase	It creates a healthy stable population of a species that
biodiversity?	can be reintroduced back into its natural habitat.
What are seed banks?	A store of seeds that can be used to grow new plants
	in the future.
What is ecotourism?	A form of tourism that minimises the impact of visitors
	on the environment.

Question	Answer
What is random sampling used for?	
How do you prevent bias during random sampling?	
What equipment is needed for a transect?	
What could a transect be used for?	
What is biodiversity?	
How are humans contributing to the loss of biodiversity?	
What methods can be used to prevent further loss of biodiversity?	
How does captive breeding increase biodiversity?	
What are seed banks?	

Question	Answer
What is random sampling used for?	
	Use a random number generator to determine where
	to place your quadrat.
What equipment is needed for a transect?	
What could a transect be used for?	
	The variety of living organisms in an area.
	Deforestation, hunting and fishing, pollution.
What methods can be used to	
prevent further loss of biodiversity?	
How does captive breeding increase	
biodiversity?	
	A store of seeds that can be used to grow new plants
	in the future.

Chris is a farmer. He is growing swedes in a field. There are many slugs in the field. The slugs move over the surface of the soil and eat his swede plants. Chris decides to buy some beetles to release into the field. These beetles eat slugs.

Before releasing the beetles, Chris wants to know how many slugs are in the field. He does a capturerecapture experiment. Chris catches some slugs, marks them and releases them. A few days later, he catches some slugs again. Chris works out that there are about **900** slugs in the field. He does the experiment again, several weeks **after** releasing the beetles. Here are the results of his second experiment:

Number of slugs in 1st sample	Number of slugs in 2nd sample	Number of marked slugs in 2nd sample
50	45	5

This is the formula he uses to analyse the results.

population size = <u>number in 1st sample × number in 2nd sample</u> number in 2nd sample previously marked

Write about the assumptions Chris has to make in estimating the number of slugs and what his results tell him about how successful his control method has been. (6)

Due date:	Friday 9 th February 2024		
Student number:			
Name:		Acade	
Y11 Triple T3 W5 -	C6 Glob	al Challenges Gramm	
Question		Answer	
What is an ore?		An ore is a rock that contains enough metal to make it	
		economically viable to extract.	
Why is carbon use	d to	Carbon can be used to extract iron as it is above iron in the	
extract iron?		reactivity series so will displace it.	
Why must electrolysis be		Electrolysis is used to extract aluminium as aluminium is more	
used to extract aluminium?		reactive than carbon in the reactivity series.	
What is the life cyc	le	The life cycle assessment is a 'cradle to grave' analysis of the	
assessment?		impact of a manufactured product on the environment.	
What is recycling? Recv		Recycling is collecting used materials and using them to produce	
		new samples of the material.	
What is fractional Fractional distillation is the separation of a mixture by boilin		Fractional distillation is the separation of a mixture by boiling	
distillation? points.		points.	
What is the general C _n H _{2n+2}		CnH _{2n+2}	
formula for an alka	ne?		
What is a homolog	ous	A homologous series is a group of chemicals which have similar	
series?		chemical properties and can be represented by a general	
		formula.	
What is cracking?		Cracking is breaking down long chain hydrocarbons into shorter	
5		more useful hydrocarbons.	
What are the conditions		Cracking needs a high temperature and a pot catalyst.	
needed for cracking?			
Look, Cover, Write	e. Check		

Question	Answer
What is the general	
formula for an alkane?	
What is cracking?	
Why must electrolysis be	
used to extract aluminium?	
What is a homologous	
series?	
What is the life cycle	
assessment?	
Why is carbon used to	
extract iron?	
What are the conditions	
needed for cracking?	
What is fractional	
distillation?	
What is cell differentiation?	
What is recycling?	

Answer
Carbon can be used to extract iron as it is about iron in the
Carbon can be used to extract from as it is above from in the
Recycling is collecting used materials and using them to produce
new samples of the material.
CnH2n+2
A homologous series is a group of chemicals which have similar
chemical properties and can be represented by a general formula.
Cracking needs a high temperature and a pot catalyst.

1. What is the formula of the functional group in alcohols?

- **Α** –CH₃
- B –COOH
- **C** –CO₂

D –OH

Your answer

2. Large molecules produced by fractional distillation are cracked to make smaller molecules.

Octane, C₈H₁₈, is cracked to form ethene, C₂H₄, and one other product. What is the formula of the other product?

- **A** C₃H₆
- **B** C₆H₁₂
- **C** C₆H₁₄
- **D** C₈H₁₆

Your answer

3. The table shows the main stages in the life-cycle assessment of a manufactured product. What is the correct order for the stages?

S	Stage	Process
	1	Manufacturing the product
	2	Obtaining raw materials
	3	Disposing of the product
	4	Using the product
Α	1, 2, 3,	4

B 1, 2, 4, 3

D 1, 2, 1, 0

C 2, 1, 4, 3

D 2, 4, 1, 3

Your [1]

[1]

[1]

Due date:	Friday 23 rd February 2024	
Student number:		
Name:		Academy
V11 Triple T4 W1 - C6 Earth's Atmosphere		

Y11 Triple T4 W1 - C6 Earth's Atmosphere

Question	Answer
Define 'atmosphere'	A layer of gases surrounding a planet.
What are the 2 main gases in	Nitrogen (78%), oxygen (21%)
the Earth's modern	
atmosphere?	
What was responsible for	Volcanic eruptions the Earth's early years released lots of
forming oceans?	water vapour which condensed to form oceans when the
	Earth cooled.
How does Earth's early	The Earth's early atmosphere contained lots of water and
atmosphere differ from the	carbon dioxide. It contained little or no oxygen and small
modern atmosphere?	amounts of other gases e.g. ammonia and methane.
How does photosynthesis	Increases the concentration of atmospheric oxygen and
affect the atmosphere?	decreases the concentration of atmospheric carbon dioxide.
How does aerobic respiration	Increases the concentration of atmospheric carbon dioxide
affect the atmosphere?	but decreases the concentration of atmospheric oxygen.
What is a pollutant?	Substances released into the environment that may harm
	living things.
What causes acid rain?	Nitrogen dioxide is emitted from car exhausts. It dissolves in
	the moisture of clouds forming an acidic solution which
	eventually falls as acid rain.
Give examples of greenhouse	Carbon dioxide, methane and water vapour.
gases.	

Question	Answer
What is a pollutant?	
What are the 2 main gases in the	
Earth's modern atmosphere?	
Define 'atmosphere'	
How does Earth's early atmosphere	
differ from the modern atmosphere?	
How does photosynthesis affect the	
atmosphere?	
How does aerobic respiration affect	
the atmosphere?	
Give examples of greenhouse	
gases.	
What was responsible for forming	
oceans?	
What causes acid rain?	

Question	Answer
What was responsible for forming oceans?	
What are the 2 main gases in the Earth's modern atmosphere?	
	A layer of gases surrounding a planet.
What is a pollutant?	
	Increases the concentration of atmospheric oxygen but decreases the concentration of atmospheric carbon dioxide.
What causes acid rain?	
	Carbon dioxide, methane and water vapour.
How does Earth's early atmosphere differ from the modern atmosphere?	
	Increases the concentration of atmospheric carbon dioxide but decreases the concentration of atmospheric oxygen.

1. Air contains a mixture of gases. The table shows the percentage by volume of different gases in air.

Gas	Percentage (%)
carbon dioxide	0.04
nitrogen	78
oxygen	21

The percentage by volume of these gases in air hardly changes because of the carbon cycle.

Explain why the percentage by volume of the gases in the table hardly changes.

Predict the effect that an increase in the world's population may have on these percentages.

Due date:	Friday 1 st March 2024	
Student number:		
Name:		Academy
		Grammái

<u>Y11 TripleT4 W2 – P7 Energy</u>

Question	Answer
What are the 8 energy stores?	Thermal, kinetic, elastic, gravitational, chemical,
	electrostatic, magnetic and nuclear.
What is the conservation of	Energy cannot be created or destroyed: it transfers from
energy?	one form to another.
Which energy store is present in a	Elastic potential
stretched spring?	
Which energy store is present in a	Chemical energy
bowl of pasta?	
Which energy store is present in a	Kinetic energy
moving car?	
What are the four transfer	Mechanical, electrical, heating with particles and
pathways?	heating with waves.
What energy transfer occurs in a	Gravitational potential energy store decreases and
falling object?	kinetic energy store increases.
What energy transfer pathway	Mechanical
occurs in a falling object?	
What energy transfer occurs in a	Chemical energy store decreases and kinetic energy
battery-operated fan?	store increases.
What energy transfer pathway	Electrical
occurs in a battery-operated fan?	

Question	Answer
Which energy store is present in a	
moving car?	
What are the four transfer	
pathways?	
What energy transfer occurs in a	
falling object?	
What energy transfer pathway	
occurs in a falling object?	
Which energy store is present in a	
bowl of pasta?	
What is the conservation of energy?	
Which energy store is present in a	
stretched spring?	
What energy transfer occurs in a	
battery-operated fan?	
What energy transfer pathway	
occurs in a battery-operated fan?	
What are the 8 energy stores?	

Look, Cover, Write, Check	

Question	Answer
	Thermal, kinetic, elastic, gravitational, chemical,
	electrostatic, magnetic and nuclear.
	Energy cannot be created or destroyed: it transfers
	from one form to another.
Which energy store is present in a	
stretched spring?	
Which energy store is present in a	
bowl of pasta?	
Which energy store is present in a	
moving car?	
	Mechanical, electrical, heating with particles and
	heating with waves.
What energy transfer occurs in a	
falling object?	
What energy transfer pathway	
occurs in a falling object?	
	Chemical energy store decreases and kinetic energy
	store increases.
What energy transfer pathway	
occurs in a battery-operated fan?	

1. This question is about gravitational potential energy (GPE) and kinetic energy (KE). Look at the diagram and information about a small ball falling from a height of 20 m.



Explain the changes in GPE and KE and describe what would happen to the GPE and KE if the mass of the ball was doubled.

Use equations to help explain your answer.

Due date:	Friday 8 th March 2024	
Student number:		
Name:		Trinity Academy
		Grammár

Y11 Triple T4 W3 – P7 Energy 2

Question	Answer
What is the equation for	GPE = mass x gravity x height
GPE?	
What is the equation for	$KE = 0.5 x mass x velocity^2$
KE?	
What is the equation for	Work done = Force x distance
work done by a force?	
What is the equation for	Work done = power x time
work done by a current?	
What is the equation for	Efficiency = $\frac{useful energy output}{useful energy output}$
efficiency?	total energy input
What is the definition of	Specific heat capacity is the energy required to raise the temperature
specific heat capacity?	of 1kg by 1°C.
How can efficiency be	Adding insulation, lubricating machines or using technology to
improved?	improve device design.
What is the definition of	The measure of how quickly energy is lost through a 1m ² area of wall
thermal conductivity?	1m thick, with a temperature difference of 1°C across it.
What is the conservation	Energy cannot be created or destroyed: it is transferred from one
of energy?	store to another.
What does energy	Dissipation is when energy is transferred to a store which is not
dissipation mean?	useful, for example when it heats the atmosphere.

Question	Answer
What is the definition of	
thermal conductivity?	
What is the equation for	
KE?	
What is the equation for	
efficiency?	
What does energy	
dissipation mean?	
What is the equation for	
GPE?	
What is the	
conservation of energy?	
What is the equation for	
work done by a	
current?	
What is the definition of	
specific heat capacity?	
What is the equation for	
work done by a force?	

How can efficiency be	
improved?	

Question	Answer
	Dissipation is when energy is transferred to a store which is not
	useful, for example when it heats the atmosphere.
What is the equation for	
work done by a force?	
	GPE = mass x gravity x height
	Adding insulation, lubricating machines or using technology to
	improve device design.
What is the	
conservation of energy?	
	Specific heat capacity is the energy required to raise the
	temperature of 1kg by 1°C.
	Work done = power x time
What is the definition of	
thermal conductivity?	
What is the equation for	
KE?	
What is the equation for	
efficiency?	

1. Table 21.1 gives some information about a kettle

Energy transferred to the kettle	525 000 J
Mass of water	1.2 kg
Starting temperature of water	25 °C
Final temperature of water	100 °C
Specific heat capacity of water	4200 J / kg °C

Table 21.1

Calculate the efficiency of the kettle described in Table 21.1.

Give your answer as a percentage.

Use an equation from the data sheet.

Efficiency = % [5]

ii. Explain why the efficiency of the kettle is less than 100%.

Due date:	Friday 15 th March 2024	
Student number:		
Name:		Academy
		Grammár

Y11 Triple T4 W4 - B6 Communicable Diseases

Question	Answer
Name the four types of	Bacteria, virus, protozoa, fungi.
pathogen that can cause	
disease.	
What can cause non	Poor diet, obesity, inheriting genetic disorders.
communicable diseases?	
How does the immune system	Engulf and digest pathogens, make antibodies, make
fight pathogens?	antitoxins
What is present in a vaccine?	Dead or inactive pathogen.
How does a vaccine provide	Stimulates antibody production. Memory cells remember
immunity?	the antibodies and make them quicker the next time the
	pathogen is encountered.
What drugs can be used to fight	Antivirals.
viruses?	
What drugs can be used to fight	Antibiotics.
a bacterial infection?	
What is the difference between	Antiseptics kill pathogens outside the body. Antibiotics kill
antiseptics and antibiotics?	bacteria inside the body.
What is a double blind trial?	A drug test in which the patients, nor the doctors know who
	has received the drug or the placebo.
What is a placebo?	A replica of a drug that contains no active ingredients.
Look Cover Write Chook	

Question	Answer
What drugs can be used to fight a	
bacterial infection?	
What is the difference between	
antiseptics and antibiotics?	
What is a placebo?	
What can cause non communicable	
diseases?	
How does the immune system fight	
pathogens?	
Name the four types of pathogen that	
can cause communicable disease.	
What is a double blind trial?	
What drugs can be used to fight	
viruses?	
What is present in a vaccine?	

How does a vaccine provide	
immunity?	
Look, Cover, Write, Check	

Question	Answer
	Bacteria, virus, protozoa, fungi.
	Poor diet, obesity, inheriting genetic disorders.
How does the immune system	
What is present in a vaccine?	
How does a vaccine provide immunity?	
	Antivirals.
	Antibiotics.
What is the difference between antiseptics and antibiotics?	
What is a double blind trial?	
	A replica of a drug that contains no active ingredients.

This question is about plant diseases.

Plant diseases can be caused by bacteria, fungi or viruses.

Complete the table by choosing words from this list to identify the **cause** of each of the diseases.

You can use each word once, more than once, or not at all.

Tomatoes are an important food crop. They can be infected by a number of different pathogens.

It is important that farmers can identify which pathogen is infecting their tomatoes as soon as possible.

Give two reasons to explain why

1	 	 	 	
2				

Due date:	Friday 22 nd March 2024	
Student number:		
Name:		Academy
		Grammár

Y11 Triple T4 W5 - B6 Feeding the Human Race

Question	Answer
What is food security?	The ability of human populations to access affordable food of sufficient quality and quantity.
What factors threaten food security?	Increasing human population, changing diets, climate change and new pests/pathogens.
What is intensive farming?	Techniques which aim to maximise food production from the minimum area of land. Often involves using chemicals e.g. fertilisers.
What is organic farming?	More natural methods of food production and avoids the use of artificial chemicals.
What is selective breeding?	The process by which humans breed animals and plants with desired characteristics.
What are the disadvantages	Takes years before all the population have the desired characteristics,
of selective breeding?	reduces genetic variation and increases chance of genetic disorders.
What is genetic	Transferring genes from a one organism into another organism, in order
engineering?	to produce an organism with desired characteristics.
What are the risks of	Eating genetically engineered organisms may lead to health risks e.g.
genetic engineering?	allergies. Genetically-engineered plants may cross-pollinate with wild
	plants, introducing the gene into the wild plant population.
What is biological control?	The control of a pest by introducing a natural enemy or predator.
How can we increase food	Maximise photosynthesis (artificial lighting, greenhouses), use of
production?	fertilisers, removing competition/pests and planting pest-resistant crops.

Question	Answer
What is intensive farming?	
What factors threaten food	
security?	
What is food security?	
What are the risks of genetic	
engineering?	
What is selective breeding?	
What are the disadvantages of	
selective breeding?	
What is biological control?	
What is genetic engineering?	
How can we increase food	
production?	

What is organic farming?	

Question	Answer
	Increasing human population, changing diets, climate
	change and new pests/pathogens.
	Techniques which aim to maximise food production from
	the minimum area of land. Often involves using chemicals
	e.g. fertilisers.
What is food security?	
	The process by which humans breed animals and plants
	with desired characteristics.
What is organic farming?	
	Transferring genes from a one organism into another
	organism, in order to produce an organism with desired
	characteristics.
What are the disadvantages of selective	
breeding?	
	The control of a pest by introducing a natural enemy or
	predator.
What are the risks of genetic	
engineering?	
How can we increase food production?	

In China, many people rely on rice for their main food supply. For many years people have grown the same varieties of rice (inbred rice). New varieties of rice are now available. They are called hybrid rice. The graph shows the yield of inbred rice and hybrid rice in a normal year and in a year with low rainfall.



When there was low rainfall, the yield of the inbred rice dropped from 4600 kg / ha to 2100 kg / ha. That is a 54% decrease. Calculate the **percentage decrease** of the hybrid rice when there is low rainfall.

Give your answer to **2** significant figures.

Hybrid rice is produced by breeding inbred rice with other types of rice found growing in the wild.

Explain why seedbanks might be useful if the climate changes in the future.

Due date:	Friday 12 th April 2024	
Student number:		
Name:		Academy
		Grammar

Y11 Triple T5 W1 – Working Scientifically

Question	Answer
What is the definition of accurate?	Close to the true value.
What is the definition of reliable	Consistent with one another: this means they have a
(sometimes called precise)?	small range.
What is the definition of valid?	The investigation is appropriate to answer the
	question: only one variable is changed.
What is the definition of repeatable?	One person can use the same method and equipment
	to obtain similar results.
What is the definition of	Someone else can repeat the experiment and obtain
reproducible?	similar results.
What is the cause of a systematic	A problem with the method. All results are affected in
error?	the same way.
What is the cause of a random	Each result is effected differently: it can be an error
error?	reading the scale or human reaction time.
What is the cause of a zero error?	A lack of calibration (setting the equipment to zero
	before use). All results are affected in the same way.
What is an independent variable?	What you change/investigate in the investigation.
What is a control variable?	The control variables are what you keep the same.

Question	Answer
What is an independent variable?	
What is the definition of repeatable?	
What is the cause of a systematic	
error?	
What is the definition of reliable	
(sometimes called precise)?	
What is a control variable?	
What is the definition of accurate?	
What is the cause of a zero error?	
What is the definition of	
reproducible?	
What is the definition of valid?	
What is the cause of a random	
error?	

Question	Answer
	The control variables are what you keep the same.
What is the definition of repeatable?	
What is the cause of a random error?	
	Reproducible means that someone else can repeat the experiment and obtain similar results.
	Valid means the investigation is appropriate to answer the question: only one variable is changed.
What is an independent variable?	
	Results which are reliable are consistent with one another: this means they have a small range.
	A zero error is caused by a lack of calibration (setting the equipment to zero before use). All results are affected in the same way.
What is the cause of a systematic error?	
What is the definition of accurate?	

Ice Control C

-Heater **1.** Two students design an experiment to find the specific latent heat of water.

They set up their equipment as shown in the diagram.

The students also have access to a power supply, a voltmeter, an ammeter, a stop-clock and a toppan balance.

* Explain how the students could use this equipment to determine an accurate value for the specific latent heat of water.