Crown Hills Community College

Year 7

Science Homework

Name ________________________             Form ________

Teacher ______________________             Room ________

“Every student will be the best they can be, will thrive in the best possible career and contribute positively to society.”
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<td>Energy extended question</td>
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<td>Modified plants experiment</td>
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<td>28</td>
<td>Hydrocarbon graph</td>
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<td>29</td>
<td>Limestone experiment</td>
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<td>Line and bar graphs</td>
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<td>Carbon dioxide graph</td>
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<td>32</td>
<td>pH graph</td>
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<tr>
<td>33</td>
<td>Temperature graph</td>
<td></td>
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<td>34</td>
<td>Oxygen bubbles experiment</td>
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<td>Hair dye experiment</td>
<td></td>
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<tr>
<td>37-38</td>
<td>Pollen grain experiment</td>
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</tbody>
</table>
Year 7 - Science Homework
Forces keywords

Name: _____________________ Form: _________ Completed on time

1. average speed
   The force that is pushing or pulling something.

2. air resistance
   The overall distance travelled divided by overall time for a journey.

3. contact force
   A piece of equipment used to measure weight in newtons.

4. newtonmeter
   Force opposing motion which is caused by the interaction of surfaces moving over one another.

5. driving force
   The force on an object moving through the air that causes it to slow down (also known as drag).

6. non-contact force
   State of an object when all forces are balanced.

7. equilibrium
   Force that acts without direct contact, e.g., magnetism or gravity.

8. friction
   Force that acts by direct contact, e.g., friction.
A comet orbits around the Sun in an orbit like the one in the diagram.

Describe and explain how the force of gravity changes during the orbit of the comet. Use your knowledge of forces to describe the effect of this on the speed of the comet. (6 marks)

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Year 7 - Science Homework

Forces extended question

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<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>bone</td>
<td>A group of tissues working together to perform a function.</td>
</tr>
<tr>
<td>joint</td>
<td>A tissue is a group of similar cells that work together to perform a certain function.</td>
</tr>
<tr>
<td>ligament</td>
<td>All the bones in an organism.</td>
</tr>
<tr>
<td>organ</td>
<td>Joins a muscle to a bone.</td>
</tr>
<tr>
<td>organ system</td>
<td>A part of the skeleton where two bones join together.</td>
</tr>
<tr>
<td>tissue</td>
<td>Joins two bones together.</td>
</tr>
<tr>
<td>skeleton</td>
<td>A group of organs working together to perform a function.</td>
</tr>
<tr>
<td>tendon</td>
<td>A tissue that forms a hard structure, used to protect organs and for movement.</td>
</tr>
</tbody>
</table>
Describe in detail how the muscles work to bend the arm and then straighten it again. (6 marks)

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Extension Task:
Research how the elbow joint is adapted to stop the bones from rubbing.
Year 7 - Science Homework

Organisms extended question

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### Matter keywords

**boiling**

The change of state from liquid to gas that occurs when particles leave the surface of the liquid only. It can happen at any temperature.

**diffusion**

In the gas state, a substance can flow and can also be compressed.

**evaporate**

The tiny things that materials are made from.

**freezing**

The movement of liquid or gas particles from a place of high concentration to a place of low concentration.

**gas**

A mixture is made up of substances that are not chemically joined together.

**liquid**

The change of state from liquid to solid.

**particle**

The change of state from liquid to gas that occurs when bubbles of the substance in its gas state form throughout the liquid.

**mixture**

In the liquid state, a substance can flow but cannot be compressed.
Matter extended question

Plan a method to monitor the changes of state in another liquid substance as it is heated.

Explain how you would calculate its boiling point from your results.

You may draw a labelled diagram to help you.

(6 marks)

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Name: _____________________      Form: _________     Completed on time ☐
Teacher: ________________________________      Effort Grade ☐

Merits awarded ☐

“Every student will be the best they can be, will thrive in the best possible career and contribute positively to society.”
Year 7 - Science Homework

Matter extended question

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“Every student will be the best they can be, will thrive in the best possible career and contribute positively to society.”
### Concentrated
A solution is dilute if it has a small number of solute particles per unit volume (litre or cubic metre).

### Corrosive
In a neutralisation reaction, an acid cancels out a base or a base cancels out an acid.

### Dilute

### Litmus
The pH scale shows whether a substance is acidic, alkaline, or neutral. An acid has a pH below 7. An alkaline solution has a pH above 7. A solution of pH 7 is neutral.

### Neutral
A solution is concentrated if it has a large number of solute particles per unit volume (litre or cubic metre).

### Neutralisation
An indicator that changes colour to show the pH of a solution. It is a mixture of dyes.

### pH Scale
A substance is corrosive if it can burn your skin or eyes.

### Universal Indicator
A solution that is neither alkaline nor acidic. Its pH is 7.
Explain these observations. Use the reactivity series provided to explain whether or not the following reactions will take place. Then describe how you could identify an unknown metal using the reactivity series.

(6 marks)

Reaction 1: iron and copper oxide
Reaction 2: zinc and magnesium oxide
Reaction 3: magnesium and magnesium oxide.

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Metal A</th>
<th>Metal B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>iron</td>
<td>copper</td>
</tr>
<tr>
<td>2</td>
<td>zinc</td>
<td>magnesium</td>
</tr>
<tr>
<td>3</td>
<td>magnesium</td>
<td>magnesium</td>
</tr>
</tbody>
</table>

Explain these observations. Use the reactivity series provided to explain whether or not the following reactions will take place. Then describe how you could identify an unknown metal using the reactivity series.

(6 marks)
discontinuous variation
- Characteristic that helps an organism survive in its environment.

species
- Where differences in characteristics between living things can only be grouped into categories.

embryo
- Contains egg cells.

fertilisation
- A group of living things that have more in common with each other than with other groups. This allows them to mate to produce fertile offspring.

adaptations
- A method of preventing pregnancy.

gametes
- A ball of cells that forms when the fertilised egg divides.

contraception
- The process where the nucleus of a sperm cell joins with the nucleus of an egg cell.

ovary (human)
- Reproductive cells. The male gamete is a sperm cell and the female gamete is an egg cell.
Animals and plants adapt to changes in the place where they live.

Describe how plants and animals change to cope with the seasons. (6 marks)

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Extension Task:

Explain the difference between continuous and discontinuous variation using examples from the human body.
Year 7 - Science Homework

Genes extended question

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“Every student will be the best they can be, will thrive in the best possible career and contribute positively to society.”
**Year 7 - Science Homework**  
**Electricity keywords**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>atom</td>
<td>Flow of electric charge, usually electrons, in amperes (A).</td>
</tr>
<tr>
<td>electron</td>
<td>If some components are in separate loops in an electric circuit.</td>
</tr>
<tr>
<td>electrostatic force</td>
<td>If components in a circuit are in the same loop in an electric circuit.</td>
</tr>
<tr>
<td>current</td>
<td>A neutral particle; everything is made of atoms.</td>
</tr>
<tr>
<td>parallel</td>
<td>A negatively charged particle found in atoms. Electrons flow through a wire when current flows.</td>
</tr>
<tr>
<td>potential difference</td>
<td>A property of a component, making it difficult for charge to pass through, in ohms (Ω).</td>
</tr>
<tr>
<td>resistance</td>
<td>The amount of energy shifted from the battery to the moving charge, or from the charge to circuit components, in volts (V).</td>
</tr>
<tr>
<td>series</td>
<td>A non-contact force acting between two charged objects.</td>
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</tbody>
</table>
Year 7 - Science Homework

Electricity extended question

Compare series and parallel circuits. Include in your answer reference to the current in each type of circuit and the potential difference. (6 marks)

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Teacher: ________________________________ Effort Grade

Merits awarded

Extension Task:
Research how a three pin plug is wired up.
Year 7 - Science Homework

Electricity extended question

Extension
<table>
<thead>
<tr>
<th>Keyword</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>food chain</td>
<td>Organism that breaks down dead plant and animal material so nutrients can be recycled back to the soil or water.</td>
</tr>
<tr>
<td>producer</td>
<td>A diagram that shows the transfer of energy between organisms.</td>
</tr>
<tr>
<td>consumer</td>
<td>Green plant or algae that makes its own food using sunlight by the process of photosynthesis.</td>
</tr>
<tr>
<td>decomposer</td>
<td>The build-up of toxic chemicals inside organisms in a food chain.</td>
</tr>
<tr>
<td>food web</td>
<td>Group of the same species living in an area.</td>
</tr>
<tr>
<td>bioaccumulation</td>
<td>A diagram that shows how food chains in an ecosystem are linked.</td>
</tr>
<tr>
<td>population</td>
<td>The area in which an organism lives.</td>
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<tr>
<td>habitat</td>
<td>Animal that eats other animals or plants.</td>
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</table>
Describe what happens in the flower following pollination until it produces seeds.

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Extension Task:
Describe in detail the structure and function of the main parts of the flower.
Year 7 - Science Homework

Ecosystems extended question

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<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
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<tbody>
<tr>
<td>weathering</td>
<td>Formed when liquid rock (lava or magma) cools and freezes. Their minerals are arranged in crystals.</td>
</tr>
<tr>
<td>cementation</td>
<td>The breaking of a rock into sediments, and their movement away from the original rock.</td>
</tr>
<tr>
<td>magma</td>
<td>The process of squashing sediments together to make new rocks by the weight of layers above.</td>
</tr>
<tr>
<td>igneous rock</td>
<td>The breaking up or wearing down of rocks. This can be by living things (biological) or by chemicals.</td>
</tr>
<tr>
<td>compaction</td>
<td>Rock formed by the action of heating and/or pressure on the sedimentary or igneous rock.</td>
</tr>
<tr>
<td>deposition</td>
<td>The 'gluing together' of sediments by different chemicals to make sedimentary rocks.</td>
</tr>
<tr>
<td>erosion</td>
<td>The settling of sediments that have moved away from their original rock.</td>
</tr>
<tr>
<td>metamorphic</td>
<td>Liquid rock below the Earth’s surface.</td>
</tr>
</tbody>
</table>
Year 7 - Science Homework
Earth extended question

Compare the heliocentric and geocentric models of the universe. Justify which model is now accepted as the correct model, stating one piece of evidence for that model. (6 Marks)

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Extension Task:
Research the difference between a solar and lunar eclipse.

“Every student will be the best they can be, will thrive in the best possible career and contribute positively to society.”
<table>
<thead>
<tr>
<th>Energy Keywords</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>energy resource</td>
<td>How quickly energy is transferred by a device (watts).</td>
</tr>
<tr>
<td>power</td>
<td>The unit of power, symbol W.</td>
</tr>
<tr>
<td>watt</td>
<td>Something with stored energy that can be released in a useful way.</td>
</tr>
<tr>
<td>kilowatt hours</td>
<td>Becoming spread out wastefully.</td>
</tr>
<tr>
<td>law of conservation of energy</td>
<td>Emptied during chemical reactions when energy is transferred to surroundings, e.g., when you burn a fuel.</td>
</tr>
<tr>
<td>chemical energy store</td>
<td>An energy resource that can be replaced and will not run out. Examples are solar, wind, waves, geothermal, and biomass.</td>
</tr>
<tr>
<td>dissipation</td>
<td>The unit of energy used by electricity companies, symbol kWh.</td>
</tr>
<tr>
<td>renewable</td>
<td>Energy cannot be created or destroyed, only transferred between stores.</td>
</tr>
</tbody>
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Year 7 - Science Homework

Energy extended question

Compare the advantages and disadvantages of building a coal-burning power station or a wind farm to provide electricity for a town.  (6 marks)

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Merits awarded

Extension Task:
Research the advantages and disadvantages of nuclear power stations.

Compare the advantages and disadvantages of building a coal-burning power station or a wind farm to provide electricity for a town.  (6 marks)

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“Every student will be the best they can be, will thrive in the best possible career and contribute positively to society.”
amplitude

The top of a wave.

infrasound

A back and forth motion that repeats.

ultrasound

Sound at a frequency of 20 Hz.

vibration

Sound at a frequency greater than 20 000 Hz, beyond the range of human hearing.

oscilloscope

Sound below a frequency of 20 Hz.

crest

The number of waves produced in one second, in hertz.

wavelength

The distance from the middle to the top or bottom of a wave.

amplify

Device able to view patterns of sound waves that have been turned into electrical signals.

To increase the amplitude of a sound so that it sounds louder.
Audrey is at the theatre watching an actor on stage. She notices that the stage lights change the appearance of the actor's clothes.

- In red light the trousers look black and the shirt looks red.
- In green light the trousers look green and the shirt looks black.
- In blue light the trousers look black and the shirt looks blue. (6 marks)
Year 7 - Science Homework

Waves extended question

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“Every student will be the best they can be, will thrive in the best possible career and contribute positively to society.”
What was the independent variable in the investigation?

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What was the dependant variable in the investigation?

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State one control variable for the investigation.

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Year 7 - Science Homework

Wind turbine variables

Explain the advantage of taking repeat readings.

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A student was investigating how the angle of tilt of a solar panel affected the energy generated by the solar panels.

<table>
<thead>
<tr>
<th>Month</th>
<th>Angle of tilt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20°</td>
</tr>
<tr>
<td>February</td>
<td>460</td>
</tr>
<tr>
<td>April</td>
<td>600</td>
</tr>
<tr>
<td>June</td>
<td>710</td>
</tr>
<tr>
<td>August</td>
<td>640</td>
</tr>
<tr>
<td>October</td>
<td>480</td>
</tr>
<tr>
<td>December</td>
<td>400</td>
</tr>
</tbody>
</table>
1. State the independent variable for the student’s investigation.

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2. State one control variable for the student’s investigation.

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3. **Describe** the trends shown in the table of results.

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**Extension**

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For each of these experiments, state the independent, dependent and control variables.

**Do earthworms prefer wet or dry soil?**
1. You have a tub filled with soil.
2. One half is wet and the other is dry.
3. You put 10 earthworms in the tub and leave them for 1 day.
4. You count how many worms are on the dry side and how many are on the wet side.

**Do bananas go brown more quickly if you keep them in the dark or in the light?**
1. You have 2 bananas you bought at the same time from the same bunch.
2. You put one banana in a cupboard and the other on a windowsill.
3. You leave them for 3 days and compare bananas to see which is darker.
### Variables

**Which object falls more quickly?**

1. You have a fork, a hairbrush and a shoe.
2. You drop them out the window at your house.
3. You time how long they take to hit the ground.

**Which is the best biscuit for dunking?**

1. You have 3 types of biscuit: Rich Tea, Custard Creams and Chocolate digestives.
2. You dunk each biscuit into a cup of tea.
3. You time how long it takes for each biscuit to break in half.
4. The biscuit that takes the longest to break is the best for dunking.

<table>
<thead>
<tr>
<th>Experiment</th>
<th>Independent</th>
<th>Dependent</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bananas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biscuits</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Year 7 – Science Homework
Washing powder experiment

Name: _____________________ Form: _________ Completed on time ☐ ☐

Teacher: ___________________________ Effort Grade ☐ ☐

Merits awarded ☐ ☐

Extension Task:
Research the difference between biological and non-biological washing powder.

Two pupils were given a sample of ‘biological’ washing powder and a sample of ‘non-biological’ washing powder.

They investigated how the two powders compare in removing egg-stains from cloth.

Plan

We put ‘biological’ powder into one bowl and ‘non-biological’ powder into the other bowl. We added water.

We put some egg-stained cloth into each bowl.

We left the bowls for 30 minutes.

We dried out the cloth and saw what happened.
Look at their report.

(a) **Give one** way they made their investigation fair.

_____________________________________________________________ 1 mark

(b) **Give two** ways they could improve their investigation.

1 _______________________________________________________________ 1 mark

2 _______________________________________________________________ 1 mark

(c) **What should they observe to compare the two types of washing powder?**

_____________________________________________________________ 1 mark

Extension

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Scientists at the University of Leeds have found a way to modify the genes of flowering plants. They claim that flowers from modified plants remain fresh in a vase of water for up to six months longer than flowers from unmodified plants.

Plan an investigation you could carry out in the school laboratory to test the claim that flowers from modified plants last for much longer than flowers from unmodified plants.

You will be provided with flowers from modified plants and from unmodified plants.

Extension Task:
Research the advantages and disadvantages of genetically modified crop plants.
Year 7 – Science Homework

Modified plants experiment

In your plan give:

• the one factor you will change as you carry out your investigation;
  (This is the independent variable.)
• the factor you will measure;
  (This is the dependent variable.)
• one of the factors you should control to ensure a fair test;
• the time scale for the investigation.
1. What has the student missed out from their graph?
2. State the independent variable for the student’s investigation.

_____________________________________________________

3. State the dependent variable for the student’s investigation.

_____________________________________________________

4. State one control variable for the student’s investigation.

_____________________________________________________

Extension

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“Every student will be the best they can be, will thrive in the best possible career and contribute positively to society.”
Year 7 - Science Homework
Photosynthesis graph

Extension Task:
Research factors that can affect the rate of photosynthesis.
Describe the trend shown in the graph.

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Extension

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__________________________________________________________________________
Year 7 - Science Homework

Hydrocarbon graph

Name: _____________________ Form: _________ Completed on time __
Teacher: _________________________________________ Effort Grade __

Merits awarded __

Extension Task:
Research hydrocarbons.

<table>
<thead>
<tr>
<th>Temperature of liquid hydrocarbon in °C</th>
<th>Time to run out of the funnel in seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>27</td>
</tr>
<tr>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>37</td>
<td>17</td>
</tr>
<tr>
<td>46</td>
<td>16</td>
</tr>
<tr>
<td>55</td>
<td>11</td>
</tr>
<tr>
<td>65</td>
<td>9</td>
</tr>
</tbody>
</table>

Plot the results in the table on the graph.

Draw an appropriate line of best fit.
One of the points is anomalous.

Draw a ring around the anomalous point on your graph.

Extension

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__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
A student investigated what happens when limestone is heated strongly.

This is the method the student used:

• measure the mass of limestone before heating
• measure the mass of solid product after heating
• repeat the experiment three more times.

The student’s results are shown in the table below.

<table>
<thead>
<tr>
<th>Experiment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass of limestone before heating in g</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Mass of solid product after heating in g</td>
<td>3.2</td>
<td>4.0</td>
<td>3.1</td>
<td>3.3</td>
</tr>
<tr>
<td>Mass lost in g</td>
<td>1.8</td>
<td>1.0</td>
<td>1.9</td>
<td>1.7</td>
</tr>
</tbody>
</table>

State one control variable for the student’s investigation
Year 7 – Science Homework

Limestone experiment

Calculate the average (mean) mass lost. Show your working and don’t forget units

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Mean mass lost: _____________________

Suggest a possible reason for the student obtaining different results each time

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Extension

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________________________________________________________________________
Draw a graph for each of the tables below, you will need to decide whether to draw a bar chart or line graph.

**Graph 1**

<table>
<thead>
<tr>
<th>Car colour</th>
<th>Number of cars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>15</td>
</tr>
<tr>
<td>Black</td>
<td>19</td>
</tr>
<tr>
<td>Silver</td>
<td>10</td>
</tr>
<tr>
<td>Yellow</td>
<td>1</td>
</tr>
<tr>
<td>Blue</td>
<td>6</td>
</tr>
</tbody>
</table>

**Graph 2**

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>60</td>
<td>49</td>
</tr>
</tbody>
</table>
### Graph 3

<table>
<thead>
<tr>
<th>Time (sec)</th>
<th>Temperature (°C)</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>135</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>180</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

"Every student will be the best they can be, will thrive in the best possible career and contribute positively to society."
Plot a graph of the student’s results on the grid below.
Label the x axis and draw a line of best fit.

<table>
<thead>
<tr>
<th>Time in minutes</th>
<th>Volume of carbon dioxide collected in cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>46</td>
</tr>
<tr>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>85</td>
</tr>
<tr>
<td>4</td>
<td>94</td>
</tr>
<tr>
<td>5</td>
<td>96</td>
</tr>
<tr>
<td>6</td>
<td>96</td>
</tr>
<tr>
<td>7</td>
<td>96</td>
</tr>
</tbody>
</table>

Name: _____________________ Form: ________ Completed on time

Teacher: __________________________ Effort Grade

Extension Task:
Describe what an anomaly is.
Year 7 - Science Homework

Carbon dioxide graph

Volume of carbon dioxide collected in cm³

Extension
Year 7 - Science Homework

pH graph

<table>
<thead>
<tr>
<th>volume of alkali added (cm³)</th>
<th>pH of resulting mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>5.0</td>
</tr>
<tr>
<td>2.0</td>
<td>5.0</td>
</tr>
<tr>
<td>4.0</td>
<td>5.0</td>
</tr>
<tr>
<td>6.0</td>
<td>5.5</td>
</tr>
<tr>
<td>8.0</td>
<td>6.0</td>
</tr>
<tr>
<td>10.0</td>
<td>7.0</td>
</tr>
<tr>
<td>12.0</td>
<td>8.0</td>
</tr>
<tr>
<td>14.0</td>
<td>8.5</td>
</tr>
<tr>
<td>16.0</td>
<td>9.0</td>
</tr>
<tr>
<td>18.0</td>
<td>9.0</td>
</tr>
<tr>
<td>20.0</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Draw a line graph for the results shown.

What would be the likely pH of the solution if the pupil added a further 2 cm³ of alkali solution?

.............

Extension Task:
Research how knowledge of acids and alkalis can help treat wasp and bee stings.
Year 7 – Science Homework

pH graph

Extension

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Year 7 – Science Homework

Temperature graph

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>20</td>
</tr>
<tr>
<td>0.5</td>
<td>26</td>
</tr>
<tr>
<td>1.0</td>
<td>31</td>
</tr>
<tr>
<td>1.5</td>
<td>36</td>
</tr>
<tr>
<td>2.0</td>
<td>41</td>
</tr>
<tr>
<td>2.5</td>
<td>46</td>
</tr>
<tr>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>57</td>
</tr>
<tr>
<td>4.0</td>
<td>56</td>
</tr>
<tr>
<td>4.5</td>
<td>58</td>
</tr>
<tr>
<td>5.0</td>
<td>59</td>
</tr>
</tbody>
</table>

Draw a graph for the results.

Draw a smooth curve of best fit.

From your curve, estimate the temperature of the water after three minutes.

............°C

Name: _____________________  Form: _________  Completed on time □

Teacher: ____________________________  Effort Grade □

Merits awarded □

Extension Task:

Research what the “resolution” of a scientific instrument is.
Year 7 - Science Homework

Temperature graph

Extension

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Year 7 - Science Homework

Oxygen bubbles experiment

Name: _____________________      Form: _________     Completed on time

Teacher: _________________________      Effort Grade

Merits awarded

Extension Task:
Research how plants get the substances they need to carry out photosynthesis.

<table>
<thead>
<tr>
<th>Distance d in cm</th>
<th>Number of bubbles per minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>52 52 54 54 53</td>
</tr>
<tr>
<td>20</td>
<td>49 51 48 52 50</td>
</tr>
<tr>
<td>30</td>
<td>32 30 27 31 30</td>
</tr>
<tr>
<td>40</td>
<td>30 10  9  11</td>
</tr>
</tbody>
</table>

Mean
Year 7 – Science Homework
Oxygen bubbles experiment

**Explain** why it is a good idea to take repeat readings for an experiment.

________________________________________________________________
________________________________________________________________
________________________________________________________________

**Calculate** the mean number of bubbles released per minute when the lamp was 40 cm from the pondweed.

________________________________________________________________
________________________________________________________________
________________________________________________________________

Mean number of bubbles at 40 cm = _________________

**Plot** the results on a line graph.

**Describe** the trend shown in the graph.

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

**State** the independent variable for the investigation

________________________________________________________________

**State** the dependent variable for the investigation

________________________________________________________________
Year 7 – Science Homework

Hair dye experiment

Name: _____________________ Form: _________ Completed on time ☐
Teacher: __________________________________ Effort Grade ☐
Merits awarded ☐

Extension Task:
List the control variables for the experiment

Jason wanted to find out if hair dye makes hair weaker.
He used 5 hairs of equal length.
He soaked each hair in a different concentration of hair dye for 15 minutes.
He added masses to each hair until it broke.
Year 7 - Science Homework

Hair dye experiment

(a) The table below shows Jason’s results.

(i) Plot a graph of Jason’s results and draw a line of best fit.

<table>
<thead>
<tr>
<th>concentration of hair dye (%)</th>
<th>mass needed to break the hair (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4</td>
<td>71</td>
</tr>
<tr>
<td>0.8</td>
<td>67</td>
</tr>
<tr>
<td>1.2</td>
<td>64</td>
</tr>
<tr>
<td>1.6</td>
<td>61</td>
</tr>
<tr>
<td>2.0</td>
<td>58</td>
</tr>
</tbody>
</table>

(ii) Use the graph to work out the mass needed to break hair soaked in water (0% hair dye).

............... g

(b) What was the independent variable that Jason changed in this experiment?

...............................................................................................................................................

(c) What was the dependent variable that Jason measured in this experiment?

..............................................................................................................................................
Hair dye experiment

(d) What is the relationship between the concentration of hair dye and the mass needed to break the hair?

...............................................................................................................................................
...............................................................................................................................................

(e) Jason wanted to investigate whether soaking hair in dye for different amounts of time affected the strength of the hair.
Jason drew a table for his results.
Add headings and units to the table below for Jason’s investigation.

<table>
<thead>
<tr>
<th>........................................ (........)</th>
<th>........................................ (........)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Extension

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Pollen grain experiment

Amy and Tom investigated how sugar affects the growth of pollen grains. They looked at pollen grains under a microscope.

Amy's Plan
- Add some pollen grains to one drop of very concentrated sugar solution.
- Add some pollen grains to one drop of dilute sugar solution.
- Count how many pollen grains have started to grow.

Tom's Plan
- Add one drop of different concentrations (0%, 5%, 10%, 15%, 20% and 25%) of sugar solution to each slide.
- Add the same amount of pollen to each drop.
- One hour later count how many pollen grains have started to grow.
- Work out the percentage.

Extension Task:
Write some clear instructions for writing a good plan.
Year 7 - Science Homework
Pollen grain experiment

(a) Give two ways in which Tom’s plan is better than Amy’s plan.

1

_________________________________________________________

2

_________________________________________________________

(b) In Tom’s investigation, what factor did he change (the independent variable)?

_________________________________________________________

(c) Look at Tom’s results in the table below.

<table>
<thead>
<tr>
<th>concentration of sugar solution (%)</th>
<th>percentage of pollen grains that had started to grow (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>25</td>
<td>0</td>
</tr>
</tbody>
</table>

He plotted five of his results on graph paper.
Plot the result for 20% sugar solution.

(d) Tom’s conclusion was, ‘The greater the concentration of sugar solution, the greater the percentage of pollen grains that had grown.’

Do his results support his conclusion?
Tick one box.

yes [ ] no [ ]

Use the results in the graph to explain your answer.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________