Science

Year 7
Satisfactory

WORK SAMPLE PORTFOLIO

Annotated work sample portfolios are provided to support implementation of the Foundation – Year 10 Australian Curriculum.

Each portfolio is an example of evidence of student learning in relation to the achievement standard. Three portfolios are available for each achievement standard, illustrating satisfactory, above satisfactory and below satisfactory student achievement. The set of portfolios assists teachers to make on-balance judgements about the quality of their students' achievement.

Each portfolio comprises a collection of students' work drawn from a range of assessment tasks. There is no pre-determined number of student work samples in a portfolio, nor are they sequenced in any particular order. Each work sample in the portfolio may vary in terms of how much student time was involved in undertaking the task or the degree of support provided by the teacher. The portfolios comprise authentic samples of student work and may contain errors such as spelling mistakes and other inaccuracies. Opinions expressed in student work are those of the student.

The portfolios have been selected, annotated and reviewed by classroom teachers and other curriculum experts. The portfolios will be reviewed over time.

ACARA acknowledges the contribution of Australian teachers in the development of these work sample portfolios.

THIS PORTFOLIO: YEAR 7 SCIENCE

This portfolio provides the following student work samples:

Sample 1 Investigation report: Separating mixtures
Sample 2 Investigation report: Water purification
Sample 3 Presentation: Should we recycle water for drinking?
Sample 4 Video analysis: Forces in sport
Sample 5 Poster: Super suits
Sample 6 Report: The Earth–sun–moon system
Sample 7 Worksheet: Classification
Sample 8 Written test: Living together
Sample 9 Investigation poster: Parachute design

In this portfolio, the student describes a range of techniques to separate a pure substance from a mixture (WS1, WS2) and applies knowledge of the effects of unbalanced forces on motion through sports science and parachute design investigations (WS4, WS5, WS9). The student explores the cycling of water through Earth systems and explains how sustainable use of water is related to understanding of the water cycle (WS2).

Science

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The student explains how the relative positions of the Earth, sun and moon are related to seasons on Earth (WS6). The student demonstrates understanding of the effect of environmental changes on feeding relationships (WS8) and uses classification to group and differentiate organisms (WS7). The student describes how scientific knowledge has been used to address the problems of water conservation (WS2) and athlete performance (WS5) and indicates how the solution might impact various groups in society differently (WS5).

The student poses a question that can be investigated scientifically (WS9), identifies variables to be changed and measured (WS1, WS9) and describes how safety was considered in the investigation (WS2). The student identifies improvements to investigation methods that could improve the quality of the data collected (WS1, WS2). The student identifies trends in data (WS1, WS9), summarises data from different sources (WS3) and uses evidence to support investigation conclusions (WS1, WS2, WS3, WS9). The student communicates ideas, methods and findings using scientific language and a range of appropriate representations (WS1, WS2, WS3, WS4, WS5, WS6, WS7, WS8, WS9).

Investigation report: Separating mixtures

Year 7 Science achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

> *By the end of Year 7, students describe techniques to separate pure substances from mixtures. They represent and predict the effects of unbalanced forces, including Earth's gravity, on motion. They explain how the relative positions of the Earth, sun and moon affect phenomena on Earth. They analyse how the sustainable use of resources depends on the way they are formed and cycle through Earth systems. They predict the effect of environmental changes on feeding relationships and classify and organise diverse organisms based on observable differences. Students describe situations where scientific knowledge from different science disciplines has been used to solve a real-world problem. They explain how the solution was viewed by, and impacted on, different groups in society.*
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> *Students identify questions that can be investigated scientifically. They plan fair experimental methods, identifying variables to be changed and measured. They select equipment that improves fairness and accuracy and describe how they considered safety. Students draw on evidence to support their conclusions. They summarise data from different sources, describe trends and refer to the quality of their data when suggesting improvements to their methods. They communicate their ideas, methods and findings using scientific language and appropriate representations.*

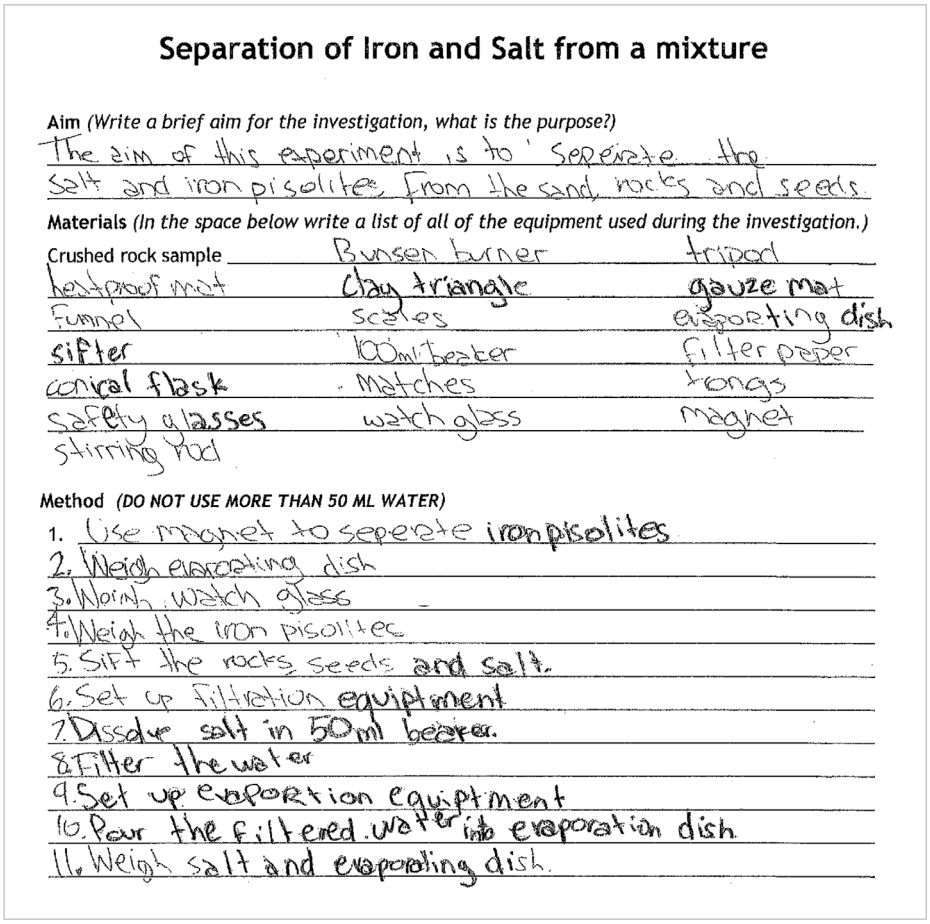
Summary of task

Students had been learning about various techniques that can be used to separate a mixture. They had completed a series of guided practical tasks where each technique was practised and applied to a common mixture. Students had also demonstrated safe working practices in the laboratory and had obtained their 'Bunsen burner licence'.

In this investigation, students were required to separate pistolite (iron ore) and salt from a mixture that also contained sand, birdseed and gravel. Three 100-minute lessons were provided to plan, undertake and complete a report on the investigation. A scaffolded worksheet was provided and students were encouraged to review their previous practical and theory work on the topic.

Students were advised that Bunsen burners present fire hazards. They were required to tie back their hair, ensure the bench space was clear of other materials and ensure they did not leave the open flame unattended. They were reminded that the equipment would be hot and could cause burns if not handled using appropriate techniques.

Investigation report: Separating mixtures



Separation of Iron and Salt from a mixture

Aim *(Write a brief aim for the investigation, what is the purpose?)*

The aim of this experiment is to seperate the salt and iron pisolites from the sand, rocks and seeds.

Materials *(In the space below write a list of all of the equipment used during the investigation.)*

Crushed rock sample, Bunsen burner, tripod, heatproof mat, clay triangle, gauze mat, funnel, scales, evaporating dish, sifter, 100ml beaker, filter paper, conical flask, matches, tongs, safety glasses, watch glass, magnet, stirring rod

Method *(DO NOT USE MORE THAN 50 ML WATER)*

1. Use magnet to seperate iron pisolites
2. Weigh evaporating dish
3. Weigh watch glass
4. Weigh the iron pisolites
5. Sift the rocks seeds and salt.
6. Set up filtration equiptment
7. Dissolve salt in 50ml beaker.
8. Filter the water
9. Set up evaporation equiptment
10. Pour the filtered water into evaporation dish
11. Weigh salt and evaporating dish.

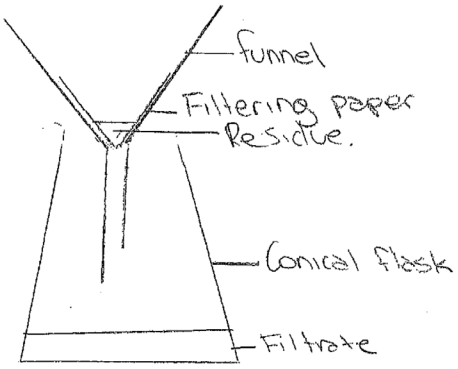
Annotations

Designs a method to separate iron and salt from a mixture.

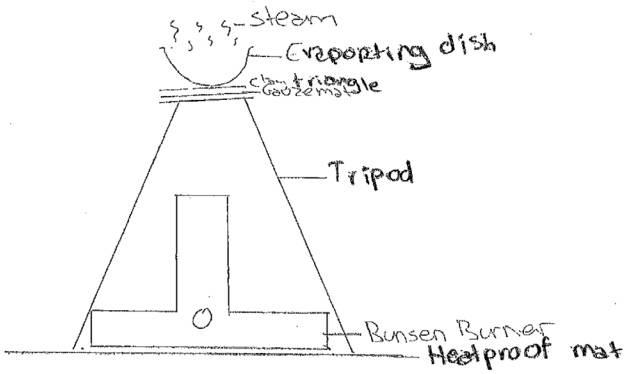
Investigation report: Separating mixtures

Diagrams of 2 of the procedures *(Make sure diagrams are drawn correctly in pencil and labelled.)*

1. Filtration



2. Evaporation



Results

1. **Iron ore recovery**

Teacher measurement of initial Mass of iron pisolites [redacted] g

Mass of Watch glass	6.6 g
Mass of Watch glass and iron pisolites	41.2 g
Mass of iron pisolites finally	6.6 g
Loss / gain in iron pisolites mass	Gain +0.1 g

Annotations

Uses scientific diagrams to represent separation techniques.

Records data collected and compares recovered quantities to original quantities.

Investigation report: Separating mixtures

2. **Salt recovery**

Teacher measurement of initial Mass of salt [redacted] g

Mass of Evaporating basin 61.3 g

Mass of evaporating basin and salt 66.7 g

Mass of salt finally 5.4 g

Loss / gain in salt mass gain + 1.5 g

Discussion *(answer the following questions in the spaces provided)*

Did you lose or gain iron? Why? What experimental errors were there with the iron?

Gained iron by 0.1 because there may have been som sand or non magnetic rocks stuck to the rocks, there n have been iron stuck to the paper from previous peop There may have been experimental erros during the wheing process.

Did you lose or gain salt? Why? What experimental errors were there with the salt?

Gained salt by 4.5g because the water didn't all evaporate and was still abit damp and carried a few more grams of salt. The salt was spitting out the evaporating dish.

Suggest 3 improvements to the separating procedures

1. Have a bigger magnet to attract more iron pisolites
2. Put a cover over the evaporating dish to prevent salt jum
3. Taking out the Gauze mat from under the clay triag

/3

Conclusion *(In sentences: could you isolate the iron and the salt? Were your techniques very accurate? How could the procedure be improved)* Yes, all the iron and salt got isolated. The techniques were very accurate because the techniques were make sure they were done right. The procedure could be improved if there were better methods.

/2

Annotations

Describes sources of error in procedures, some of which are based on discrepancies in data.

Suggests improvements to procedures that could minimise identified errors.

Annotations (Overview)

The student uses scientific language and diagrams to communicate ideas, methods and findings.

Investigation report: Water purification

Year 7 Science achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

> *By the end of Year 7, students describe techniques to separate pure substances from mixtures. They represent and predict the effects of unbalanced forces, including Earth's gravity, on motion. They explain how the relative positions of the Earth, sun and moon affect phenomena on Earth. They analyse how the sustainable use of resources depends on the way they are formed and cycle through Earth systems. They predict the effect of environmental changes on feeding relationships and classify and organise diverse organisms based on observable differences. Students describe situations where scientific knowledge from different science disciplines has been used to solve a real-world problem. They explain how the solution was viewed by, and impacted on, different groups in society.*
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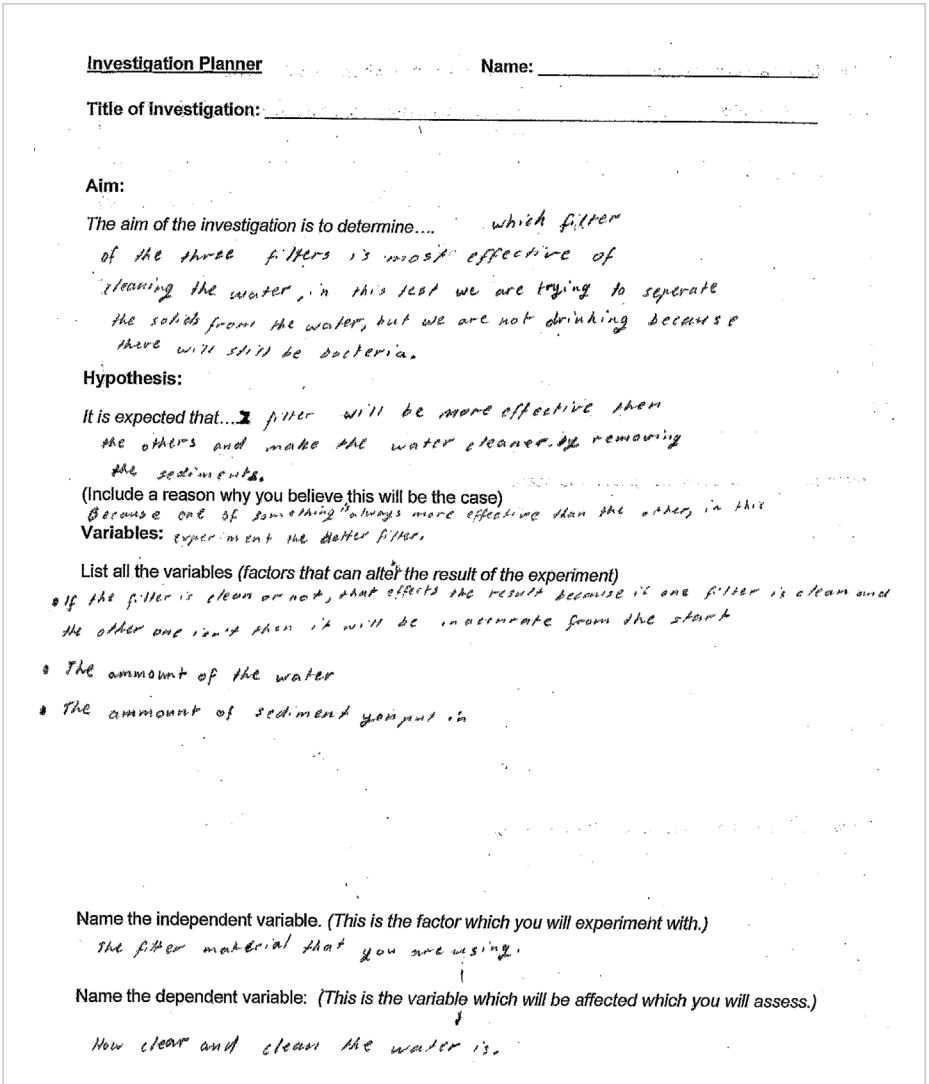
Summary of task

Students were investigating the ways in which different substances could be separated from a range of mixtures. They had undertaken guided practical tasks using filtration apparatus and were familiar with basic measuring equipment. Students were also aware of the requirements for carrying out fair tests and the need to control variables.

In this task, students worked in groups of three to design and conduct an investigation comparing how well household materials filter polluted water. Each group was given 150 mL of polluted water. Students were required to supply their own filtering materials and other household equipment. Three 50-minute lessons were allocated to complete the scaffolded planning worksheet, three lessons to undertake the experiment and two lessons for the final scientific report.

Students were warned not to ingest the polluted water.

Investigation report: Water purification



Investigation Planner Name: _____

Title of investigation: _____

Aim:

The aim of the investigation is to determine.... which filter of the three filters is most effective of cleaning the water, in this test we are trying to seperate the solids from the water, but we are not drinking because there will still be bacteria.

Hypothesis:

It is expected that... filter will be more effective then the others and make the water cleaner by removing the sediments.

(Include a reason why you believe this will be the case)
Because one of something always more effective than the other, in this experiment the better filter.

Variables:

List all the variables *(factors that can alter the result of the experiment)*

- If the filter is clean or not, that effects the result because if one filter is clean and the other one isn't then it will be inaccurate from the start
- The ammount of the water
- The ammount of sediment you put in

Name the independent variable. *(This is the factor which you will experiment with.)*
The filter material that you are using.

Name the dependent variable: *(This is the variable which will be affected which you will assess.)*
How clear and clean the water is.

Annotations

Identifies a safety precaution to be followed.

Identifies independent and dependent variables.

Investigation report: Water purification

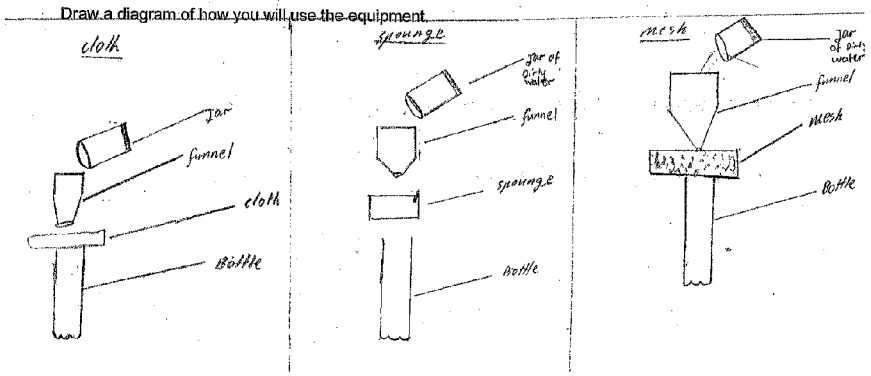
List the variables that will be kept the same. These are factors which you will control.

Controlled variable	How you will ensure it remains constant for all situations.
• ammount of water put in • same type of liquid • same size bottles	• measure the ammount of water • pour same liquid type of same bottle • use the same size bottles

Materials: List all the equipment you need.

- 1 sponge
- 4 jars
- 1 mesh
- 1 cloth
- water
- sediment
- 3 soft drink bottles
- 1 scissors
- knife

Draw a diagram of how you will use the equipment.



Annotations

Identifies some variables to be controlled and suggests strategies to control them.

Constructs a scientific diagram to illustrate the equipment set-up.

Investigation report: Water purification

Title: Comparing household filters

Colleagues:

Introduction:

The importance of water filtration can be to clean the water for drinking to make it Safe for drinking or bathing in eg; it could get boiled or just filtered with materials but do all to make it safer.

Aim:

The Aim of the investigation was to determine which of the three filters was the most effective for cleaning the water also just to see if they worked at all.

Hypothesis:

It was expected that the sponge was going to work most effectively because it was more dense and had more layers than the other materials that were used. So that would make it more effective.

Method:

1: The tops of the three bottles were cut off the bottle so that it could make a filter to make it easier to poor the water in and so it makes it better and wont spill.

2: The top of the bottles were placed on the top of the inside of the bottles so that it makes a funnel to pour the water in.

3: A piece of mesh 7cm by 5cm, sponge 8cm by 4cm and a cloth 15cm by 9cm were collected and placed in the funnel to create a filter.

4: The dirty water was poured into each filter and container.

5: The water in the containers was observed to see which of the three filters worked the best.

Annotations

States a clear aim for the investigation.

Constructs a hypothesis and provides a justification for reasoning.

Describes an appropriate method for the investigation.

Investigation report: Water purification

Results and observations:

Trial#	Material	Appearance of filter	Appearance of filtrate
1.	Chux cloth (3 layers)	.clay on cloth .sediment on cloth	.a tangy colour .more water than others .filtrated fast .a bit of sediment on the bottom of the bottle
2.	Sponge (not folded)	.Clay on sponge .Sediment on sponge	.a light tangy colour .good amount of water .filtrated fast
3.	Mesh (not folded)	.clay on mesh .sediment on mesh	.darker tangy colour .good amount of water .filtrated fast .alot sediment /clay on the bottom of the bottle

Discussion:

The sponge worked better than the other two materials tested (cloth and Mesh) because it was a better filter; because it was a more dense material then the other materials used it trapped more of the dirt. At the end result the sponge's water was cleaner/clearer. What we could have done better for the other two materials was pour the water in slower because it went too fast and the dirt went through the materials. Also we should have had the same size bottle to start off with because it made it take longer to measure because we had to borrow other bottles and it took too long. We should have folded the cloth more times than three because that would have it better. The material that worked the worst was the mesh it was the dirtiest, its holes were too big so a lot of dirt went through into the bottle to prevent more of the dirt that went through we should have folded the mesh so the holes weren't as big. All of the three filters after the result managed to keep some sediment and clay from going in the filter it showed on the filter. I thought the filters would be more effective than they were, I thought that they would trap more of the dirt than they did in the end result it surprised me, because they don't have big holes except the mesh.

Conclusion:

What the experiment found was that none of the materials really worked that well ,at the end result the water was still pretty dirty . The hypothesis was correct the sponge worked as the best of the three filters.

Annotations

Constructs an appropriate table to summarise and describe quantitative data.

Analyses the results to summarise findings.

Identifies sources of error in the method used.

Annotations (Overview)

The student uses scientific language and representations to communicate methods and findings of an investigation.

Presentation: Should we recycle water for drinking?

Year 7 Science achievement standard

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Summary of task

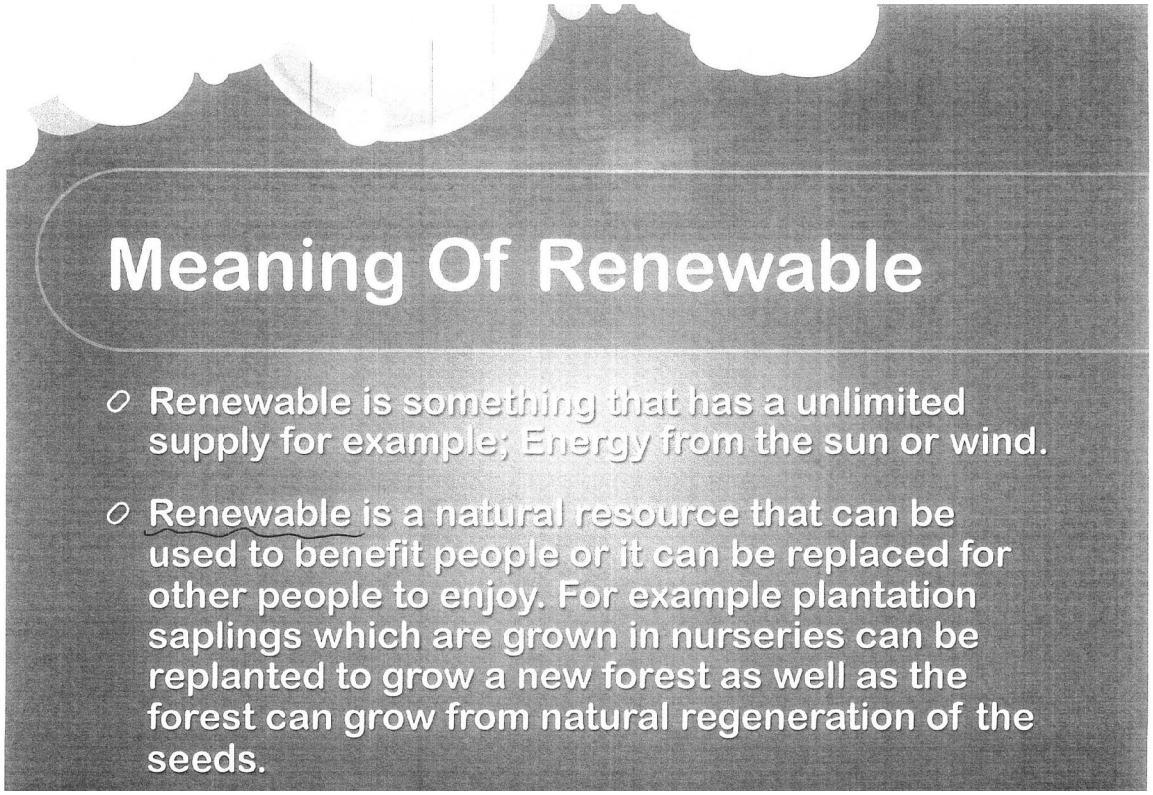
This task was undertaken at the end of a unit of work on water as an important resource. Throughout the unit, students performed various experiments and tests on water samples. They investigated the water cycle from Indigenous perspectives and analysed water use throughout the world. They also researched media reports on the issue of recycling water.

The question posed to students was, 'Should waste water be recycled and used for drinking?' Students were given approximately two weeks to complete the task, including four lessons to carry out their research. Students were asked to present their findings using a visual aid of their choice.

Presentation: Should we recycle water for drinking?

Annotations

Presentation: Should we recycle water for drinking?



Annotations

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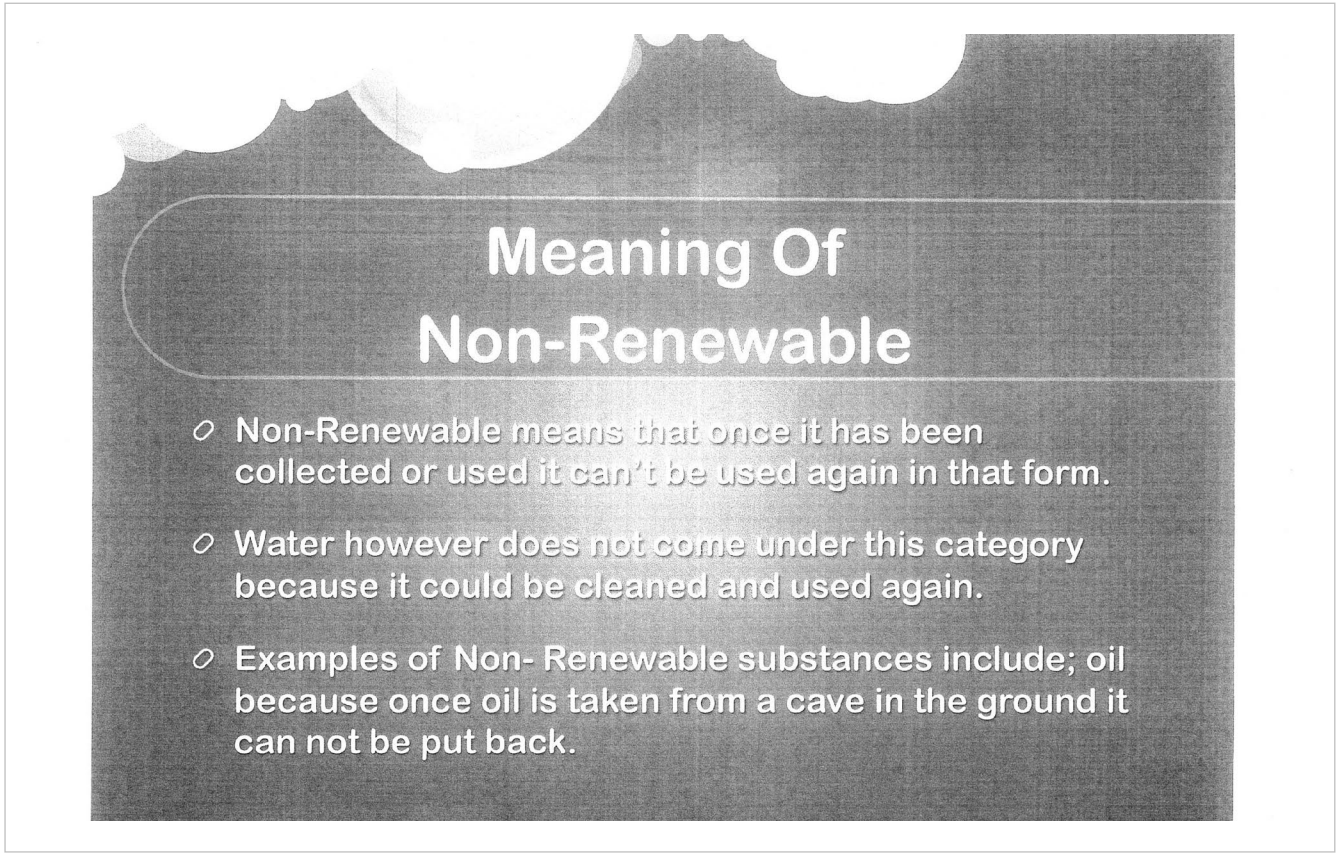

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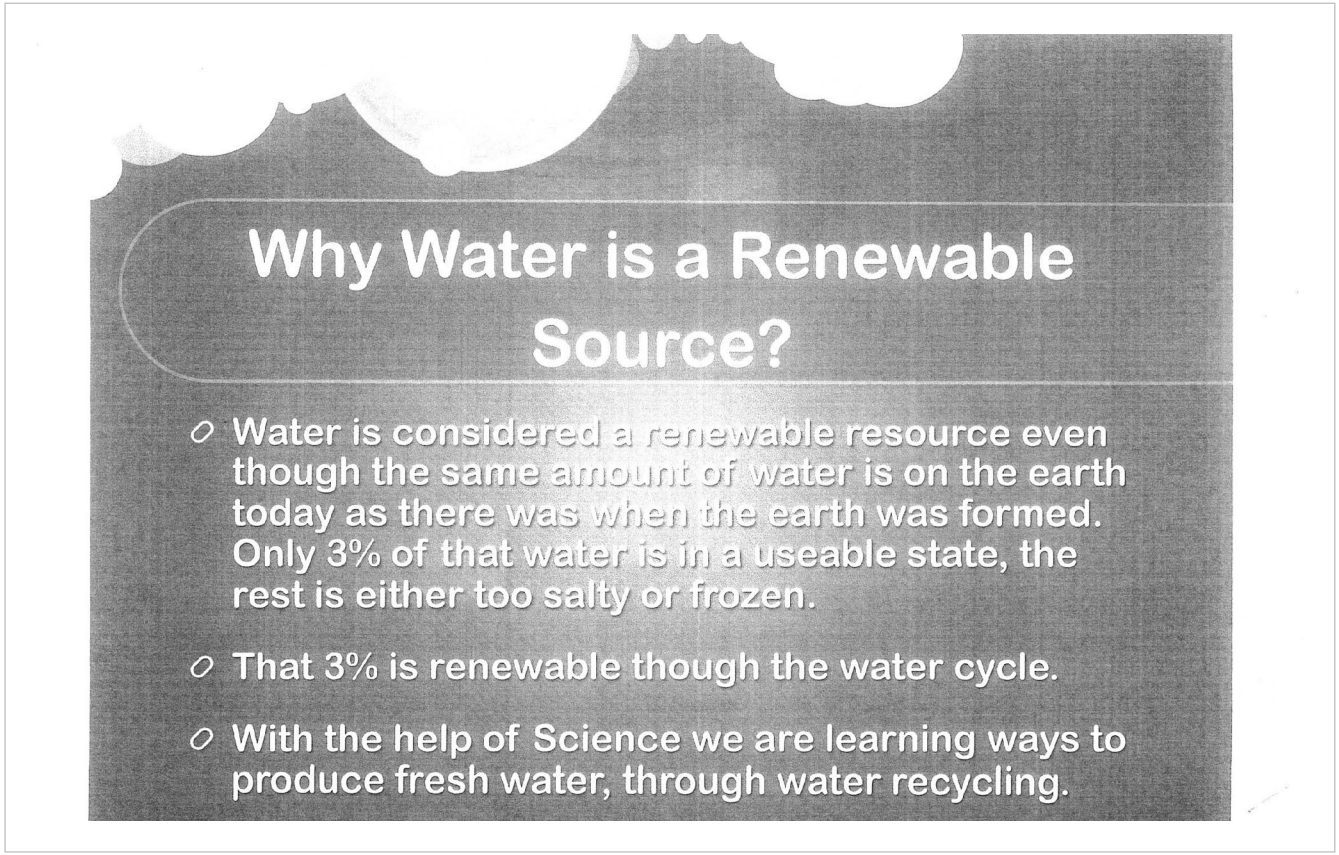
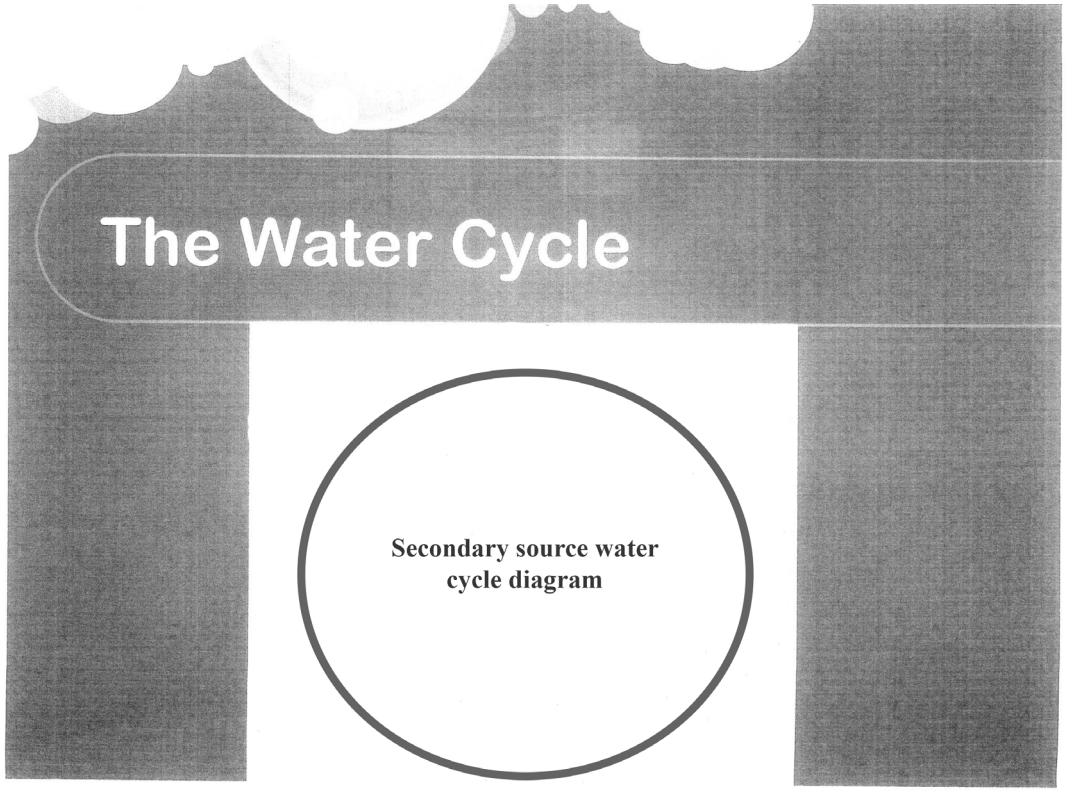


Annotations

Identifies that water is a renewable resource that cycles through the water cycle.

Presentation: Should we recycle water for drinking?



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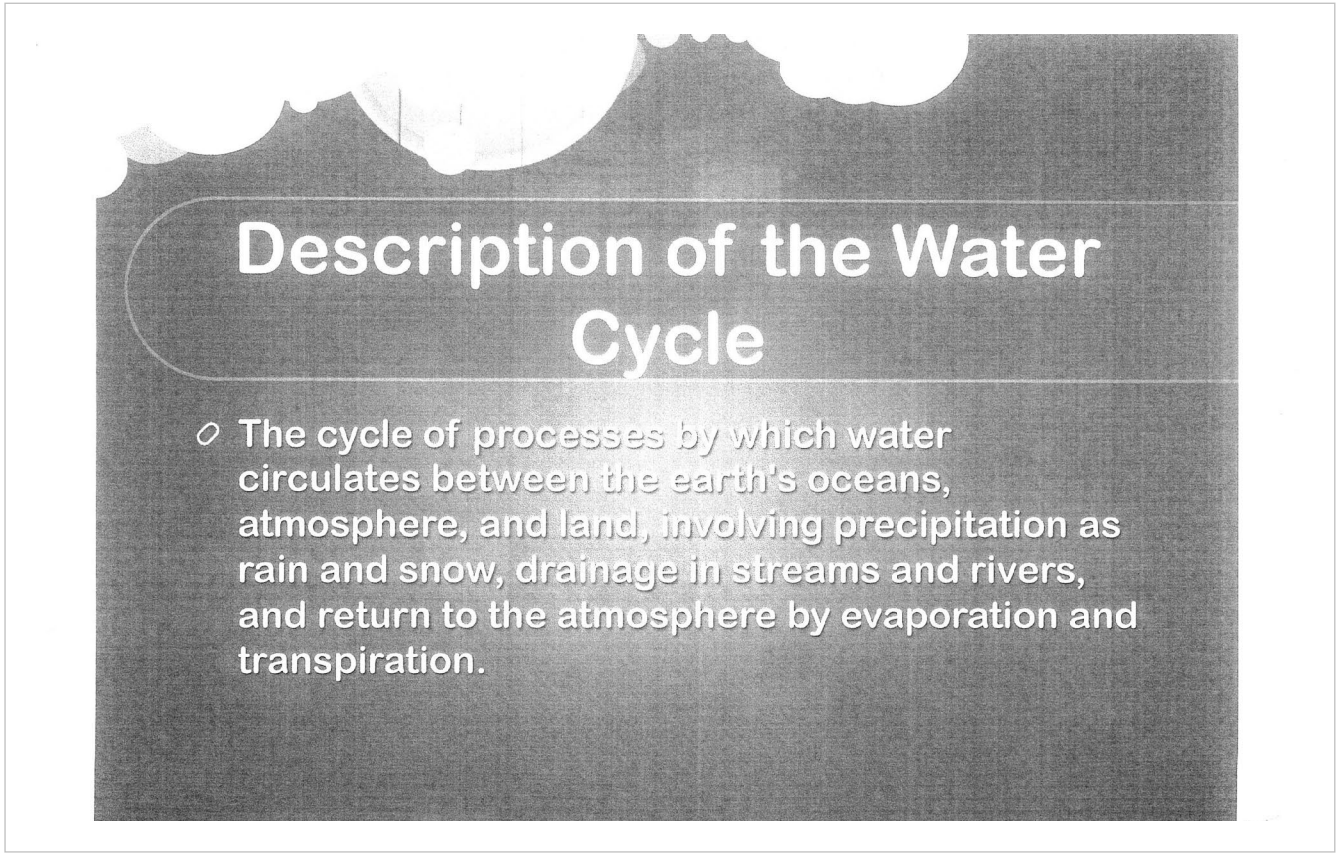
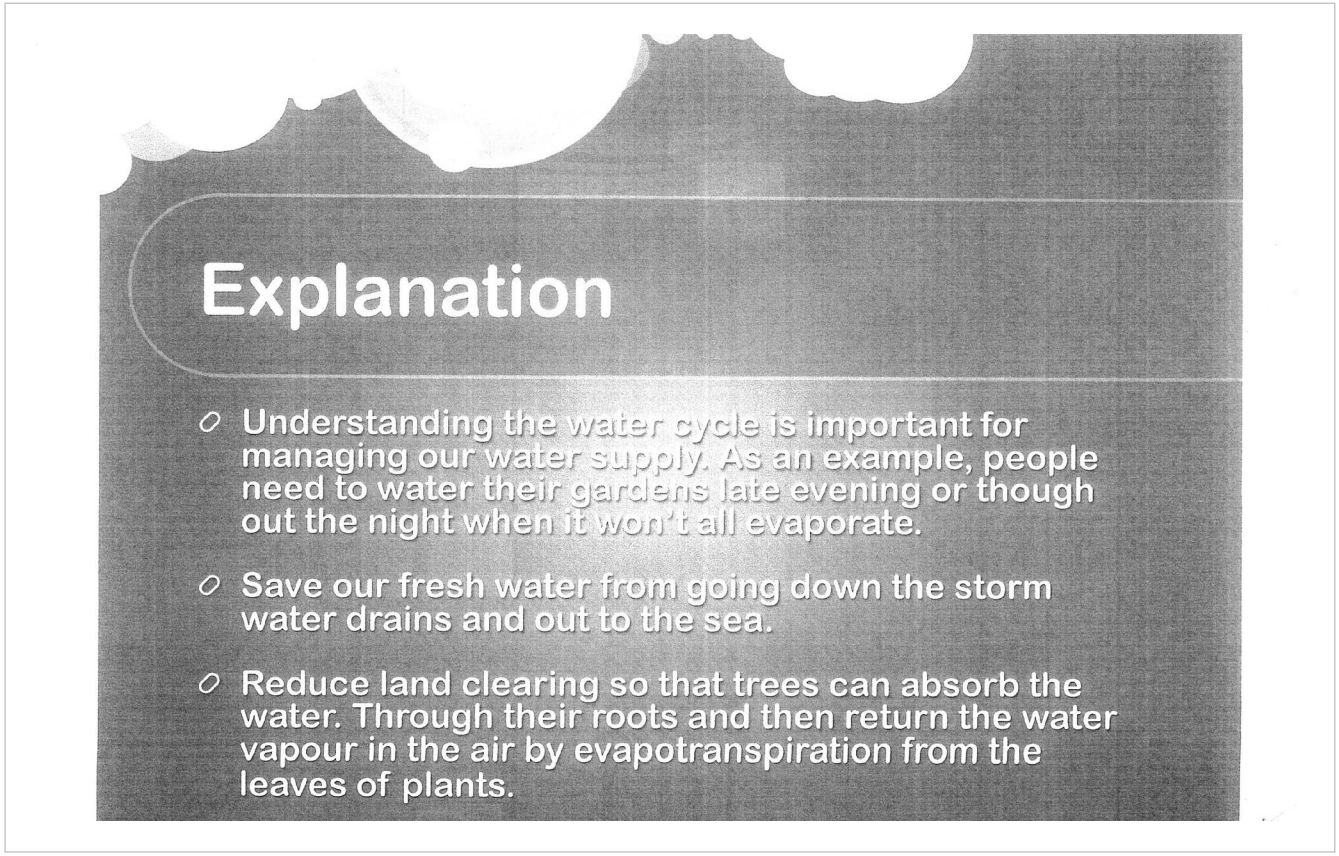


Annotations

Provides a definition of the water cycle that indicates movement of water between Earth systems.

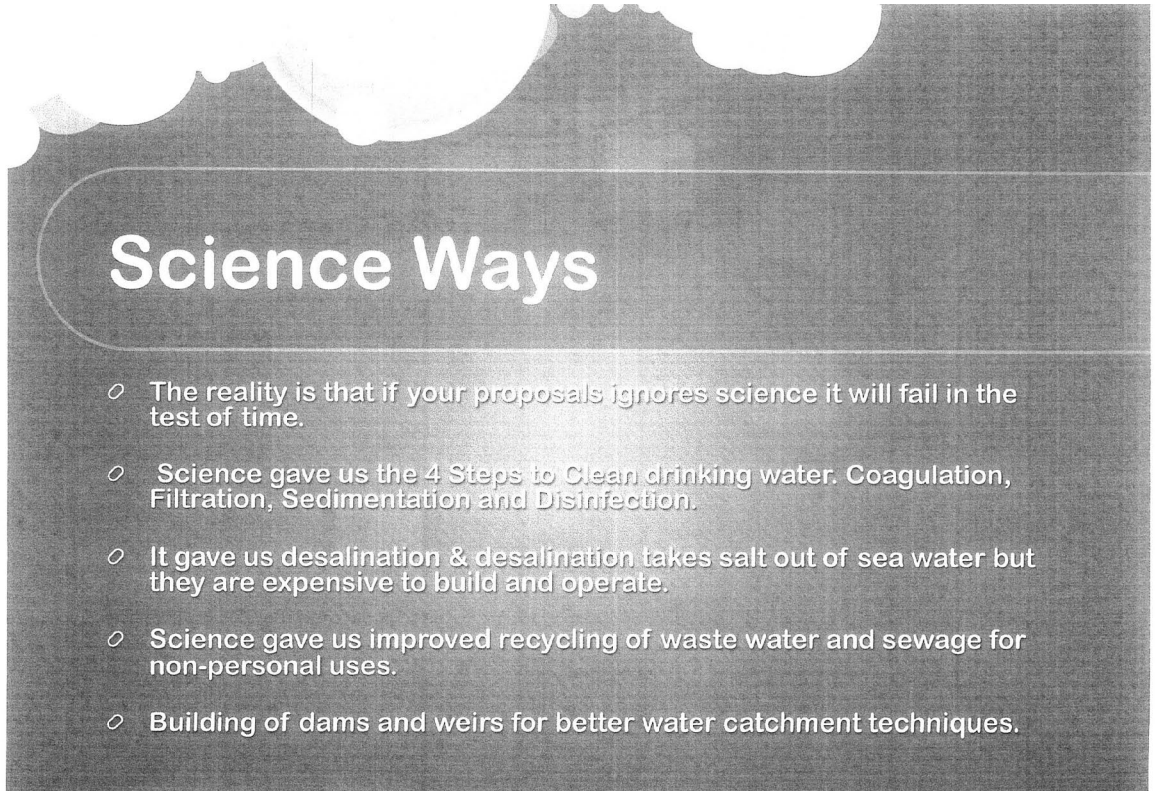
Presentation: Should we recycle water for drinking?



Annotations

Explains water conservation actions with reference to the water cycle.

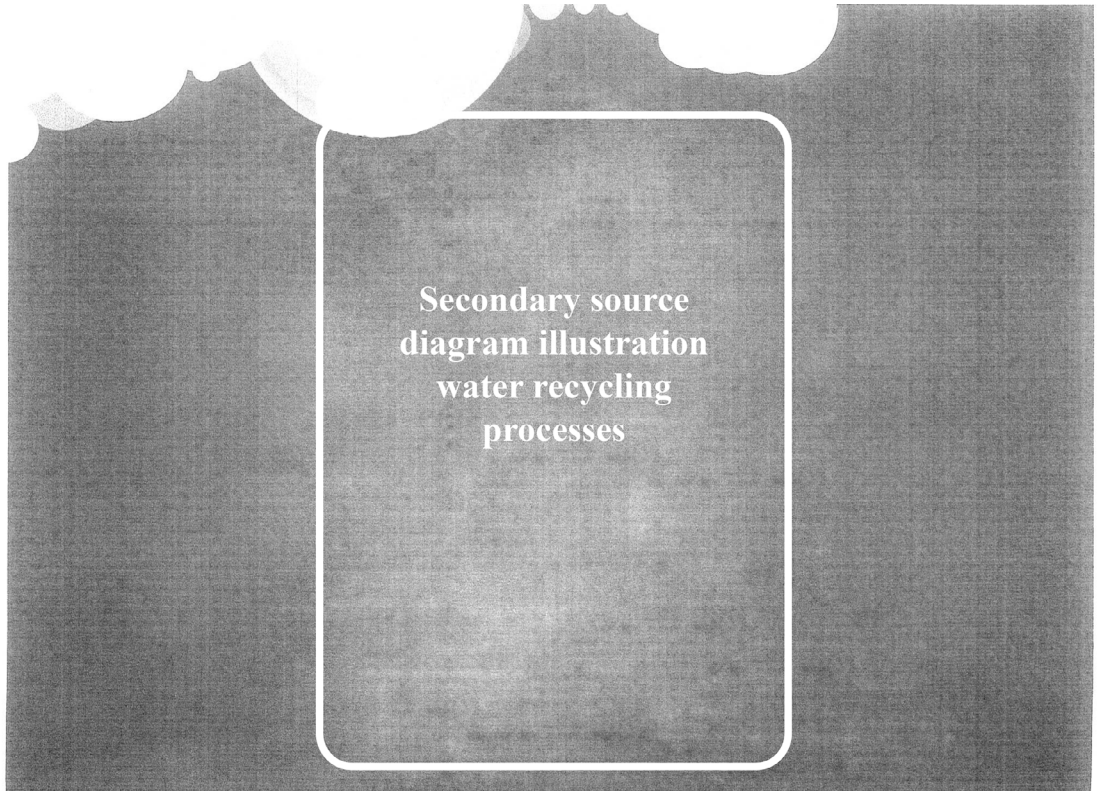
Presentation: Should we recycle water for drinking?



Annotations

Identifies the ways in which science and scientists have contributed to water conservation efforts.

Presentation: Should we recycle water for drinking?



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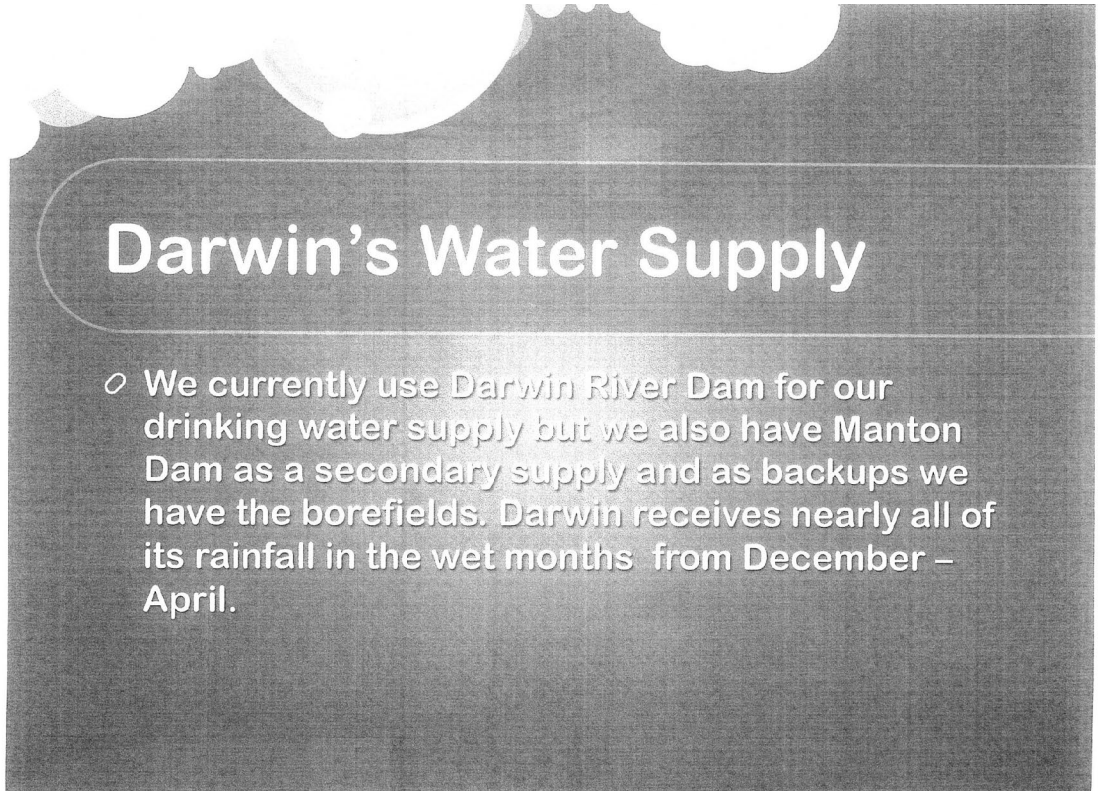

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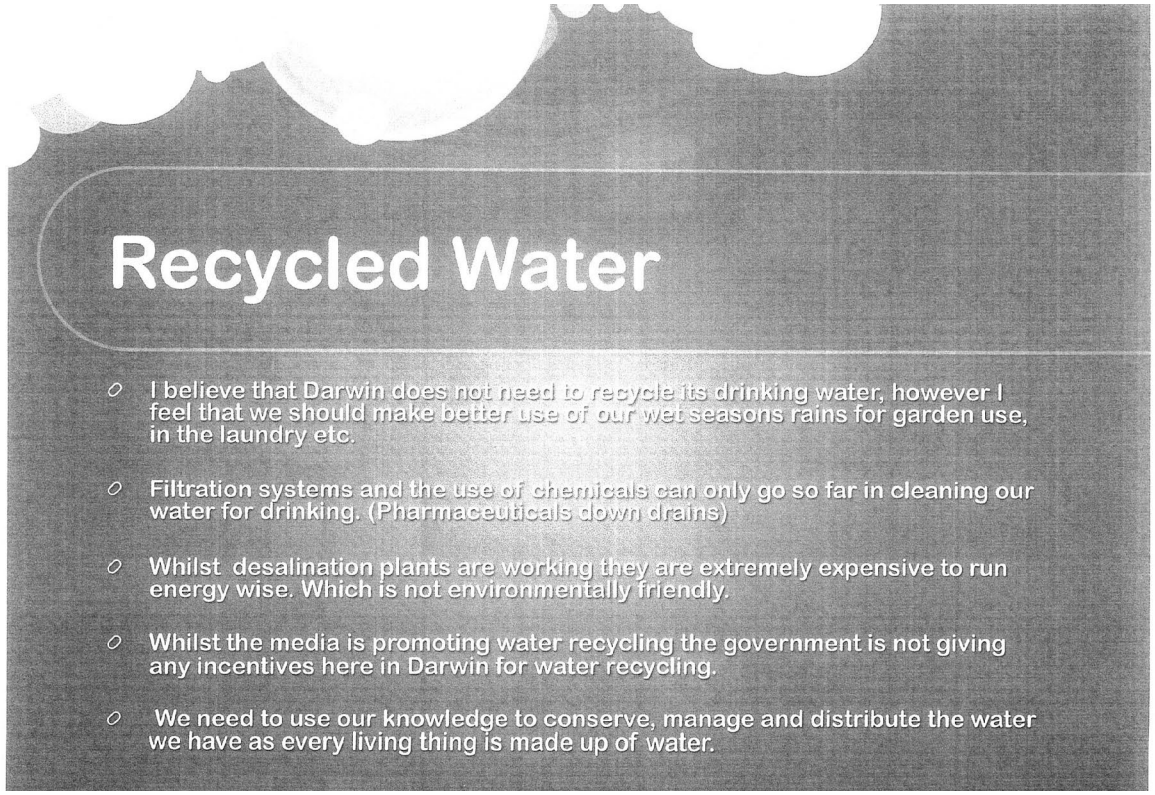
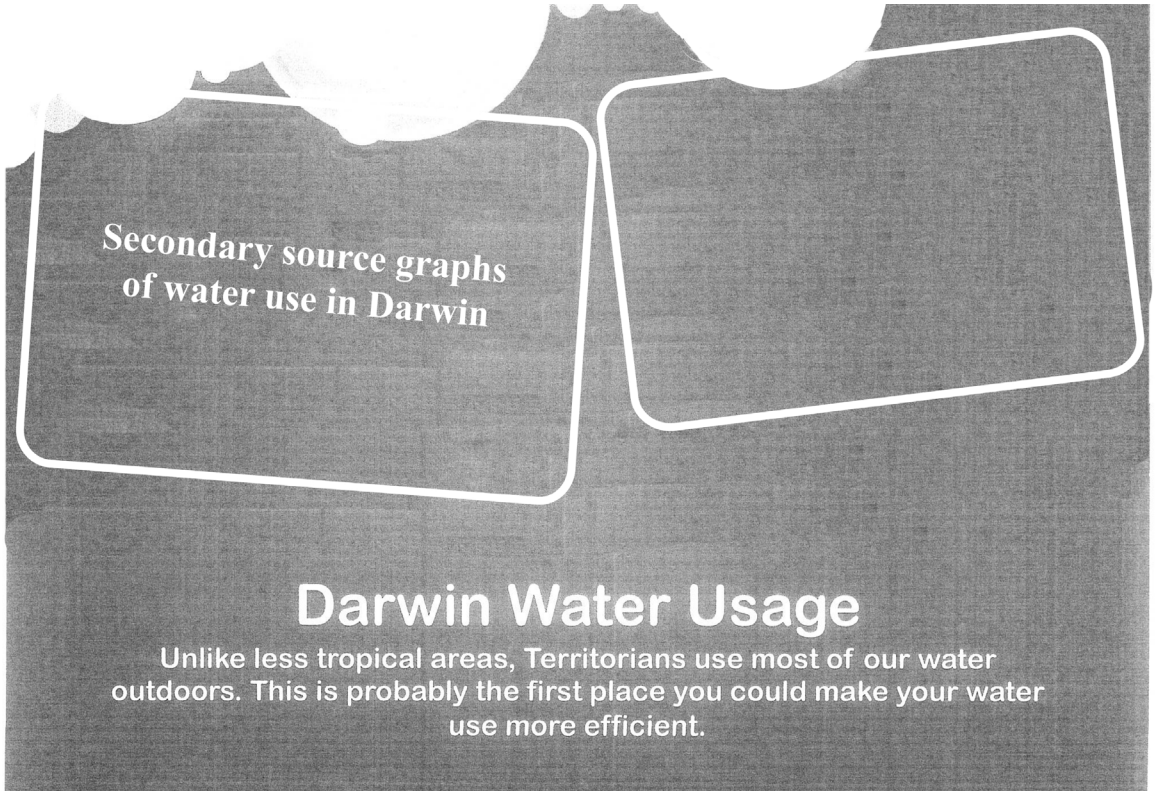


Annotations

Evaluates the value of recycling drinking water with reference to the impacts on the environment and society.

Presentation: Should we recycle water for drinking?



Annotations

Presentation: Should we recycle water for drinking?

Annotations

Annotations (Overview)

The student constructs evidence-based arguments based on data from a range of sources and uses scientific language and appropriate representations to communicate ideas and research findings.

Video analysis: Forces in sport

Year 7 Science achievement standard

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Summary of task

Students were part way through a unit investigating forces. They had explored the effect of pushes and pulls, gravity and friction on the motion of objects. They had discussed the concepts of balanced and unbalanced forces, and how these could be inferred by analysing the motion of objects.

In this task, students were asked to take on the role of a sports scientist and make observations about an athlete's performance in pole vaulting. After watching a short video clip of an athlete competing in this event, students considered the forces involved and their effects on the athlete's motion and the pole. They used force arrows to show the direction and relative size of the forces and were asked to make predictions based on scenarios in which the forces were changed. Students also considered how the athlete's performance could be improved in light of their understanding of the forces involved.

Video analysis: Forces in sport

Simple Machines and Sport

In an effort to improve performance at the next Olympics, the Australian Institute of Sport has decided to recruit you as a trainee **Sport Scientist** because of your knowledge of simple machines and levers. A Sport Scientist (also known as a **Biomechanist**) makes observations and interprets data in relation to sporting performance and provides advice to coaches about how to help their athletes improve. Watch the following clip to learn more about biomechanics:

http://www.ausport.gov.au/participating/coaches/videos/intermediate/basic_biomechanics

The sport you have been chosen to assist with is **Pole Vault**. This is a track and field event where the athlete uses a long, flexible pole (usually made of fibreglass or carbon fibre) to help them leap over a bar. Ancient Greeks, Cretans and Celts competed in pole vaulting events. It has been an Olympic sport for men since 1896 and women since 2000.
Source: http://en.wikipedia.org/wiki/Pole_vault

http://olympics.time.com/2012/06/27/how-they-train-pole-vaulting-with-joel-stein/

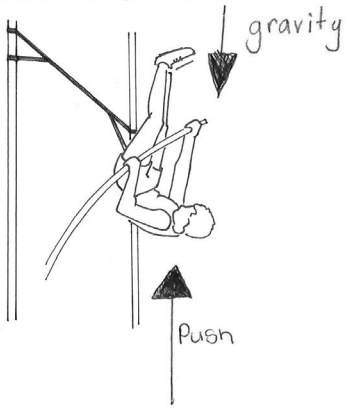
Watch the following clip of Steve Hooker, an Australian Olympic athlete, competing to qualify for the London Olympics and then answer the questions below.

http://www.youtube.com/watch?v=eYoEWZqFjNM&NR=1&feature=endscreen

1. Thinking about the athlete and his complete journey, list as many forces as you can that are involved in pole vaulting and explain briefly the effect of each force on the athlete or the pole.

- push, pole and to push him over the line/band
- gravity, pull on the athlete ~~pushing~~ pulling him back down onto the mats.
- Friction, on the athlete & pole when the athlete starts running and when the pole ~~goes~~ stops to launch Steve Hooker

2. On the diagram below draw an arrow to show the direction and relative size of each of the forces acting on the athlete. The athlete is travelling upwards and about to go over the bar.



Annotations

Identifies the forces acting on a pole vaulter.

Uses arrows to represent opposing forces acting on a pole vaulter.

Video analysis: Forces in sport

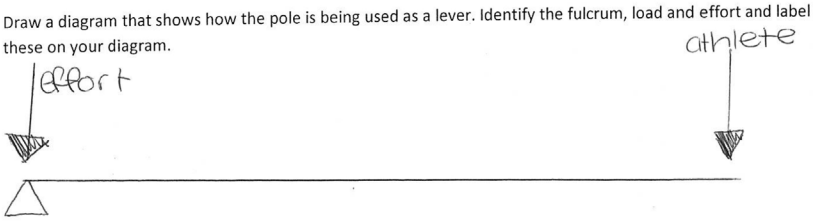
3. Using the diagram above, predict what would happen to the athlete if:
   a) the force of gravity was larger than the pushing force of the athlete?

Steve Hooker would fall to the ground.

   b) the opposing forces are balanced?

he would be moving at a constant speed

4. Draw a diagram that shows how the pole is being used as a lever. Identify the fulcrum, load and effort and label these on your diagram.



5. As a trainee Sport Scientist, what advice would you give to a pole vaulting coach to help them improve their athletes?

Run faster so you have more force to get over the line/band

Annotations

Predicts an effect of unbalanced forces on a pole vaulter.

Identifies that opposing forces are balanced when an object is moving at a constant speed.

Annotations (Overview)

The student communicates ideas using scientific language and appropriate representations.

Poster: Super suits

Year 7 Science achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

> *By the end of Year 7, students describe techniques to separate pure substances from mixtures. They represent and predict the effects of unbalanced forces, including Earth's gravity, on motion. They explain how the relative positions of the Earth, sun and moon affect phenomena on Earth. They analyse how the sustainable use of resources depends on the way they are formed and cycle through Earth systems. They predict the effect of environmental changes on feeding relationships and classify and organise diverse organisms based on observable differences. Students describe situations where scientific knowledge from different science disciplines has been used to solve a real-world problem. They explain how the solution was viewed by, and impacted on, different groups in society.*
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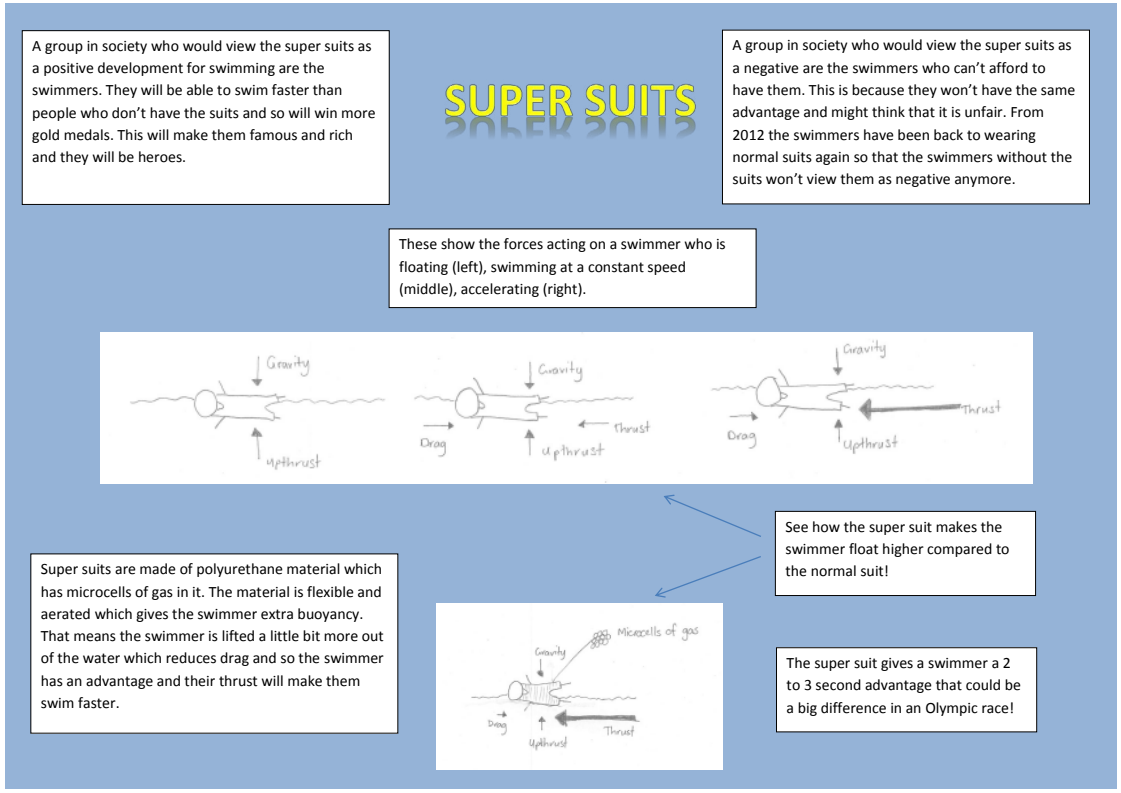
> *Students identify questions that can be investigated scientifically. They plan fair experimental methods, identifying variables to be changed and measured. They select equipment that improves fairness and accuracy and describe how they considered safety. Students draw on evidence to support their conclusions. They summarise data from different sources, describe trends and refer to the quality of their data when suggesting improvements to their methods. They communicate their ideas, methods and findings using scientific language and appropriate representations.*

Summary of task

Students were investigating the forces that act on athletes and objects in various Olympic sports. They were familiar with concepts such as friction, gravity, thrust and buoyancy and the way that they impact on motion. They had considered examples in which scientific knowledge of forces had been used to improve the performance of athletes.

In this task, students were required to answer a series of questions relating to the forces that act on swimmers and the role that improved swimsuits have had on swimmers' performance. Students were encouraged to use their workbooks and carry out research to help them answer the questions. They were required to present their answers in the form of a small poster. Students commenced the task during a 100-minute lesson and completed it in their own time over the following week.

Poster: Super suits



Annotations

Identifies societal groups who viewed the development of the super suits positively and negatively and explains why they hold these views.

Constructs force diagrams to illustrate the forces acting on a swimmer at rest, moving at constant speed and accelerating.

Explains the effect of the super suits with references to the forces that affect the swimmer's movement.

Explains how scientific knowledge has improved the performance of Olympic swimmers.

Annotations (Overview)

The student uses scientific language and appropriate representations to communicate science ideas.

Report: The Earth–sun–moon system

Year 7 Science achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

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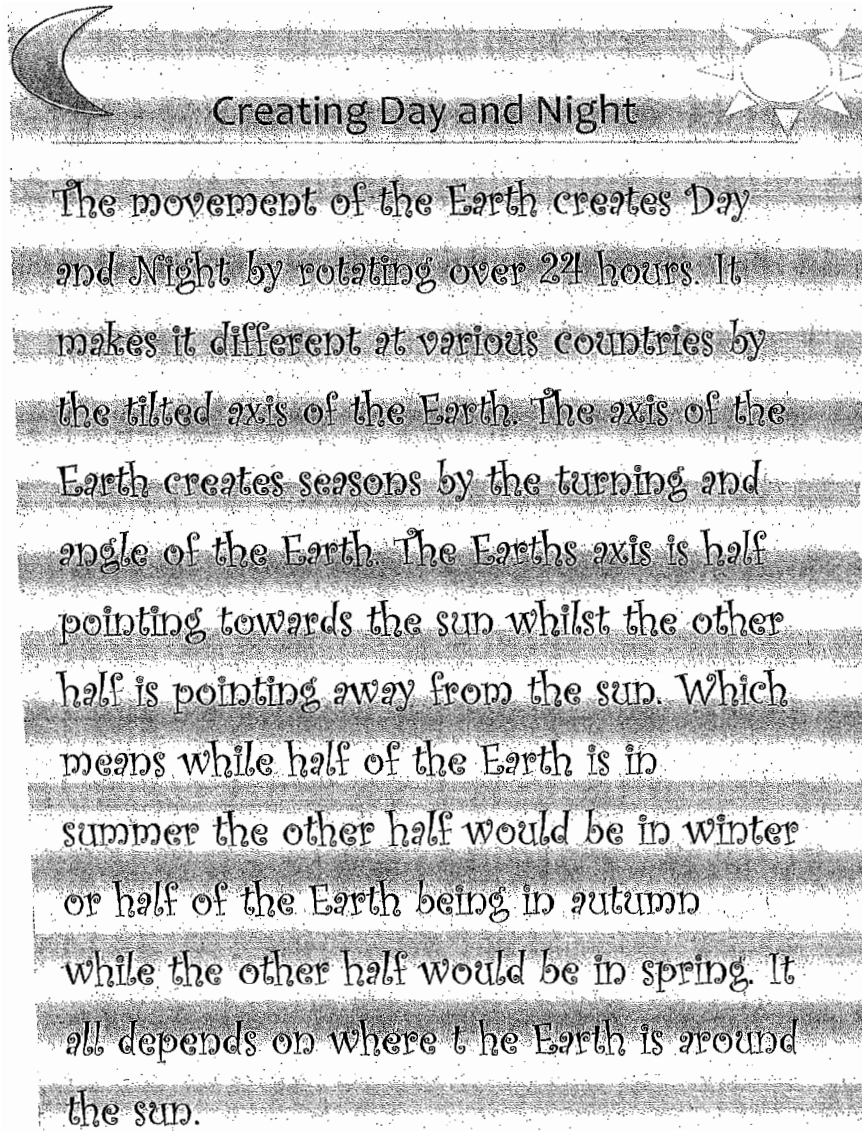
Summary of task

Students had been investigating the Earth–sun–moon system, including manipulating physical and digital models and engaging in role plays to explore the relative movement of each body.

Students were asked to provide a written or word-processed response to a number of questions relating to the Earth–sun–moon system. Students began the task in class during a 50-minute lesson, and were required to complete the task for homework. Students were encouraged to draw on their existing knowledge and understanding and undertake research to ensure that their answers were factually correct.

Report: The Earth–sun–moon system



Creating Day and Night

The movement of the Earth creates Day and Night by rotating over 24 hours. It makes it different at various countries by the tilted axis of the Earth. The axis of the Earth creates seasons by the turning and angle of the Earth. The Earths axis is half pointing towards the sun whilst the other half is pointing away from the sun. Which means while half of the Earth is in summer the other half would be in winter or half of the Earth being in autumn while the other half would be in spring. It all depends on where t he Earth is around the sun.

Annotations

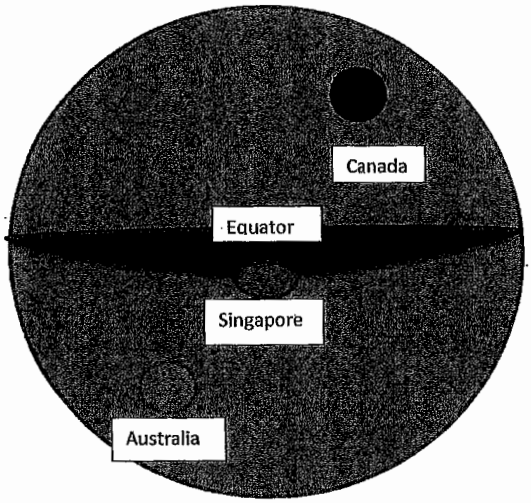
Identifies that the tilt of Earth on its axis, and its position in relation to the sun, accounts for the seasons.

Report: The Earth–sun–moon system

Seasons

Diagram of Earth's three locations...

- Australia (Blue)
- Singapore (Red)
- Canada (Black)
- Equator (Black line)



Explain how and why the seasons are different in the 3 locations.

It is different in all these countries because they are all in various locations around Earth. This means they might be closer to the sun or further away from the sun because of the tilted axis of the Earth. For example if you were living in Canada and they were around the side of the sun where Canada is closer to the sun then they would be in summer, when Canada is in summer Australia would be in winter because it is further away from the sun, although for Singapore who is located on the equator you would not be closer or further away from the sun. This means that they don't really have seasons they just have smooth, steady weather the whole time because they are neither closer nor further away from the sun.

Annotations

Recognises that the seasons that countries experience at a given time depends on their location on Earth's surface.

Identifies that countries located near the equator experience seasons differently.

Report: The Earth–sun–moon system

The moon affects us in lots of ways. One important way is through the tides. There are two low tides and two high tides each day. Fish move with the tides so fishermen need to pay close attention to high and low tides so they know when to put out their nets. The tides also affect when they leave to go out to sea and when they should come back. If they don't make it in before low tide they may not be able to get back because there won't be enough water to travel through or they might get stuck in the sand half way.

How do Australian indigenous cultures explain the phases of the moon?

In many Australian indigenous cultures the sun is female and the moon is male. There are lots of stories that explain why the moon gets fatter and then fades away to nothing. One story from Arnhem Land is that the full moon is a fat lazy man called Ngalindi. His wives punish his laziness by chopping off bits of him with their axes which causes the waning moon. He manages to escape by climbing a tall tree to follow the sun but is wounded too badly and dies which is the new moon. After he is dead for three days he rises again and grows fat and round which is the waxing moon, until his wives attach him again and the cycle is repeated over and over. This story relates to what we know about the repeating phases of the moon.

Annotations

Identifies that the moon influences the tides and explains how tidal movements affect people in their daily lives.

Annotations (Overview)

The student communicates ideas and findings using appropriate scientific language and representations.

Worksheet: Classification

Year 7 Science achievement standard

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Summary of task

Students had investigated developing and using dichotomous keys to classify various groups of living and non-living things. They had discussed the role of classification generally, and its specific role in science.

Students were required to make observations at a local wildlife park and to complete a number of tasks related to classifying the animals at the park. They were required to complete the task individually.

Worksheet: Classification

WHY CLASSIFY?

There are millions (maybe tens of millions) of different species on Earth – some organisms are clearly different, whilst others share many similar features. Compare a kangaroo and emu – they appear very different, but what features do kangaroos and emus have in common? What features make them different?

Complete the table below:

Feature	Kangaroo	Emu
Live on land	√	√
Feathers	X	√
Fur	✓	x
Pouch	✓	x
Lays eggs	x	✓
Beak	x	✓
Australian	✓	✓

Many organisms share common features, which allow them to be grouped – this is classification. Scientists classify organisms to make them easier to identify. The classification system begins with very big groups (lots of organisms) and moves down into smaller groups (fewer organisms).

Questions:

1) Explain *why* scientists classify living organisms? It makes it easier to study animals and other living things and to see the relationships between animals.

2) Explain *how* scientists group organisms? Scientists look at the features of living things and put them into big groups first and then gradually ~~slowly~~ into smaller and smaller groups.

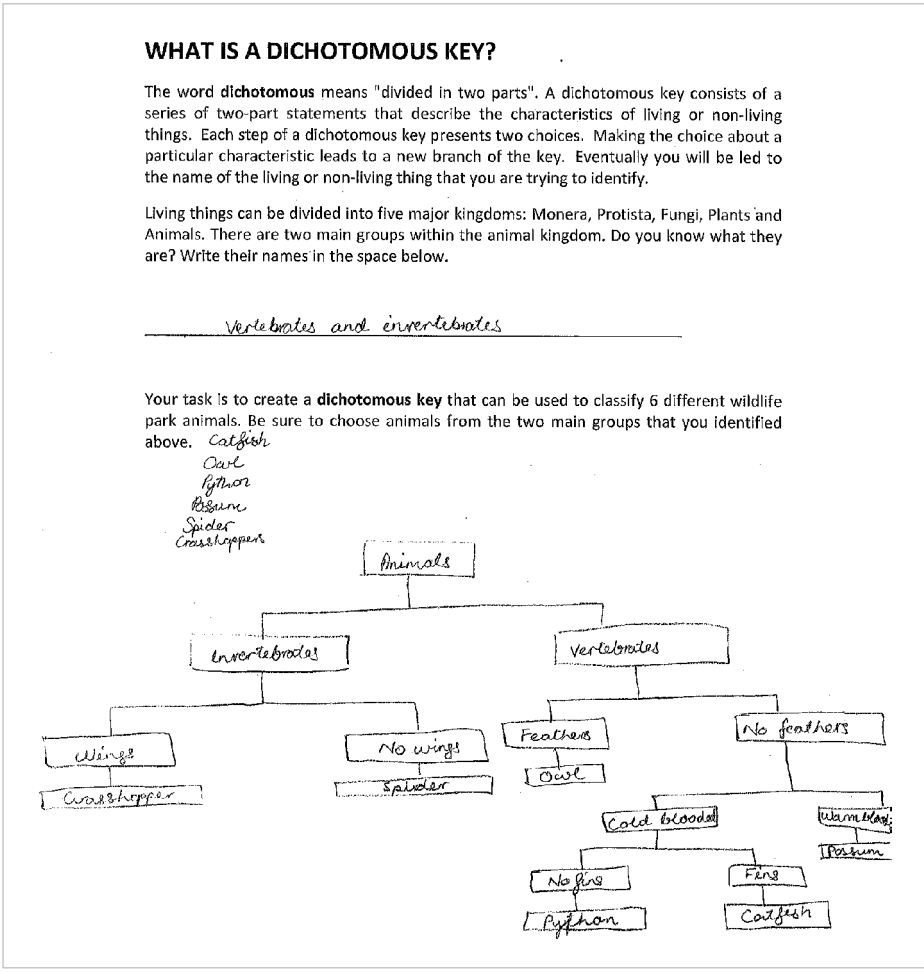
Annotations

Identifies observable features of kangaroos and emus.

Explains that scientists classify organisms to identify relationships.

Identifies that classification relies on sorting observable features of organisms.

Worksheet: Classification



WHAT IS A DICHOTOMOUS KEY?

The word **dichotomous** means "divided in two parts". A dichotomous key consists of a series of two-part statements that describe the characteristics of living or non-living things. Each step of a dichotomous key presents two choices. Making the choice about a particular characteristic leads to a new branch of the key. Eventually you will be led to the name of the living or non-living thing that you are trying to identify.

Living things can be divided into five major kingdoms: Monera, Protista, Fungi, Plants and Animals. There are two main groups within the animal kingdom. Do you know what they are? Write their names in the space below.

Vertebrates and invertebrates

Your task is to create a **dichotomous key** that can be used to classify 6 different wildlife park animals. Be sure to choose animals from the two main groups that you identified above. Catfish, Owl, Python, Possum, Spider, Grasshopper

Annotations

Constructs a dichotomous key based on observable features to classify vertebrates and invertebrates.

Annotations (Overview)

The student uses appropriate language and representations to communicate scientific ideas and findings.

Written test: Living together

Year 7 Science achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

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Summary of task

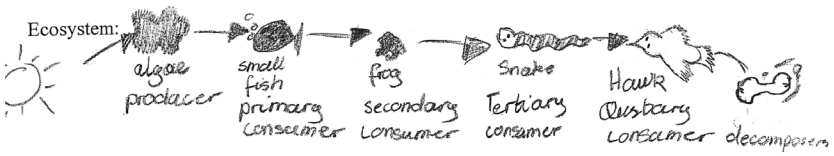
Students had undertaken a unit of work on ecosystems and the ways in which biotic components interact within ecosystems. They completed various field, online and classroom-based activities where they explored the features of different ecosystems, the ways in which organisms interacted, and the impact of environmental changes on those relationships.

Students completed a written test at the end of the unit. They were provided with 50 minutes to complete the test. This work sample includes a selection of the test questions.

Written test: Living together

4. Create a food chain using the following animals: Place a name for the ecosystem, insert the arrows, draw and name the organism and label the consumer

- hawk, algae, small fish, snake, frog,



a) Place the sun in the food chain
b) Place decomposers in the food chain
c) What would happen to this food chain if a plague of locusts destroyed the population of algae? Explain in detail.

The snake wouldn't really like the locusts, so they would go, and so would the Hawk.

The frog would increase, and the fish would decrease because the frog population is so big.

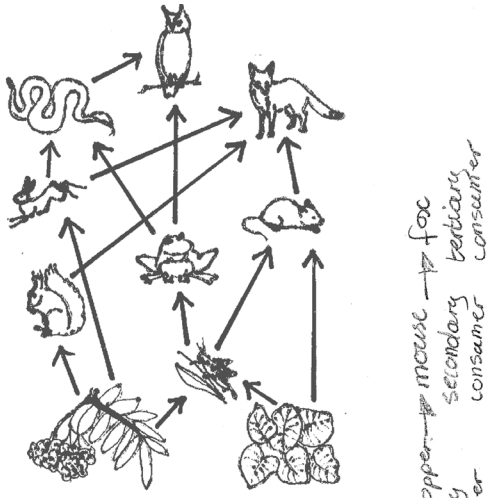
Annotations

Constructs a plausible food chain using appropriate representations.

Classifies organisms according to their feeding relationships.

Predicts changes to organism populations as a result of flow-on effects of environmental change.

Written test: Living together



5. A Food Web illustrates many food chains and consumers

i) Below draw out two food chains that are within this food web

ii) If the rabbits were killed by hunters what would happen to the food web?
The fox population would decrease, and the plant would increase.

iii) What are the top predators within this food web?
The fox and owl

iv) What ecosystem would this food web be in?
Grassland

v) If the berries were all picked by humans to eat, what would happen to food web?
All the animals would decrease because the primary consumer would have no food to eat.

Annotations

Identifies two different food chains within a food web.

Makes plausible predictions about the effect of population change on organisms within a food chain.

Identifies that changes to producer populations have flow-on effects for all organisms within the food web.

Annotations (Overview)

The student uses scientific language and constructs appropriate representations to communicate ideas.

Investigation poster: Parachute design

Year 7 Science achievement standard

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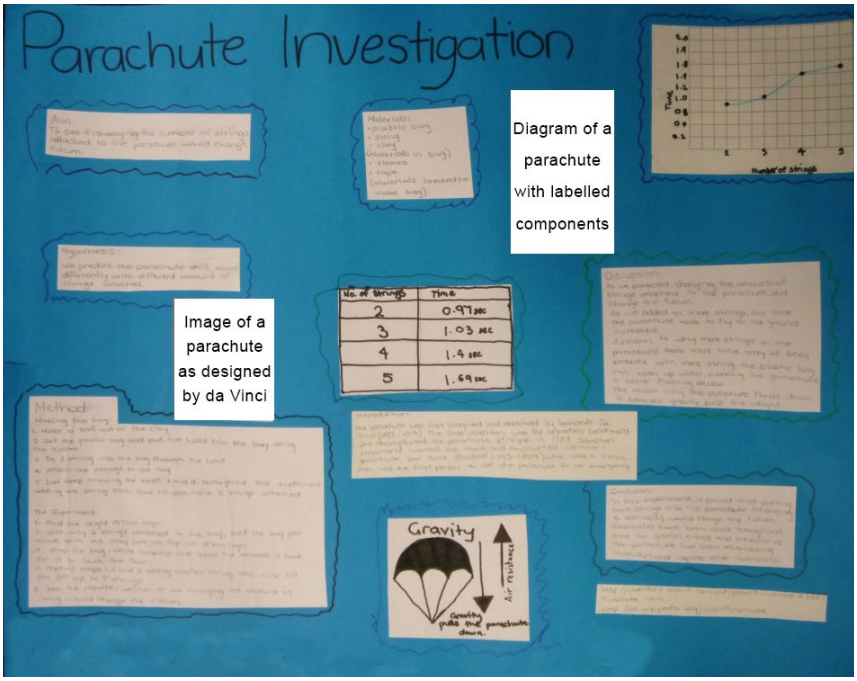
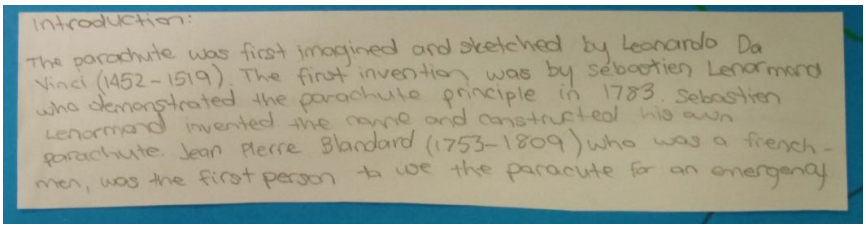
Summary of task

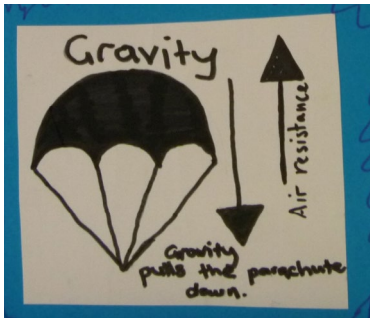
As part of a unit on unbalanced forces, students were assigned the task of investigating parachute design and constructing an experiment into one variable. Students independently selected their investigation question and designed an experimental method. They were required to present their method and findings in the form of a poster for an audience of their peers.

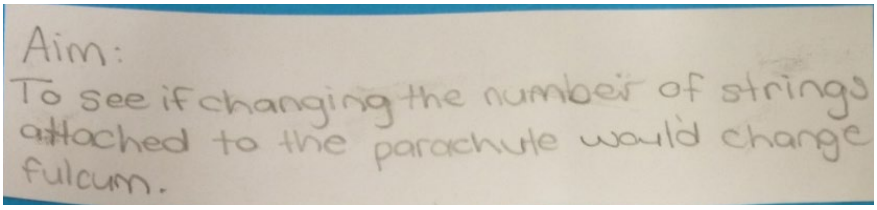
Students were provided with three lessons in class to design and conduct their investigation. They completed the work in their own time.

Investigation poster: Parachute design







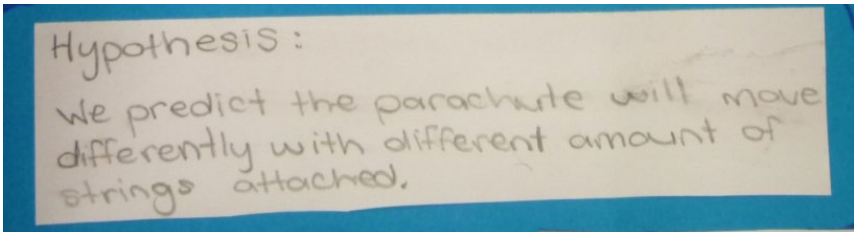


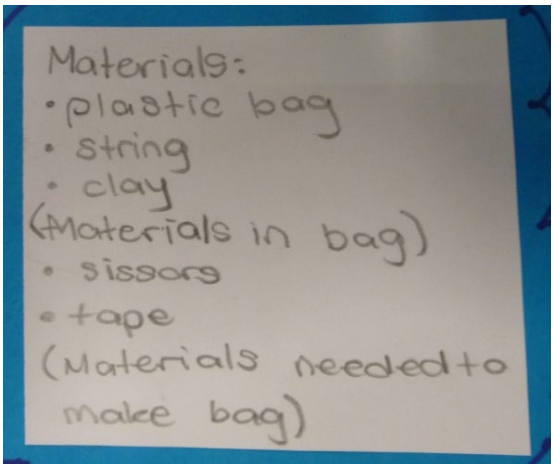
Annotations

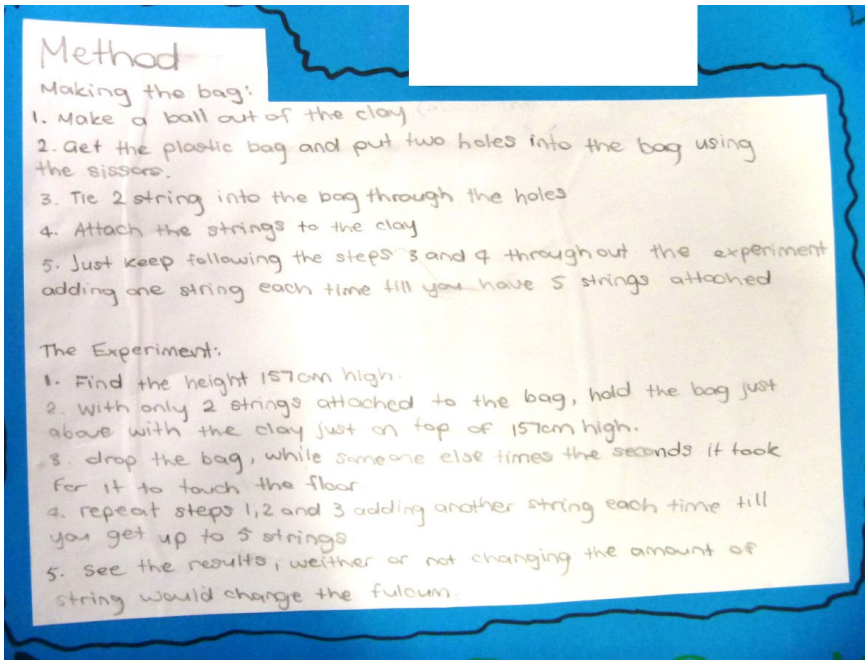
Constructs a force diagram to indicate the effects of gravity and air resistance on the movement of the parachute.

Poses a question that can be investigated scientifically.

Investigation poster: Parachute design





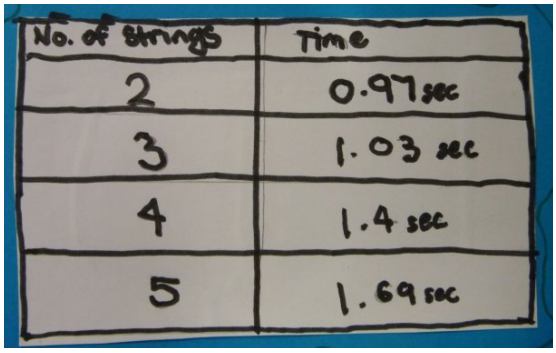


Annotations

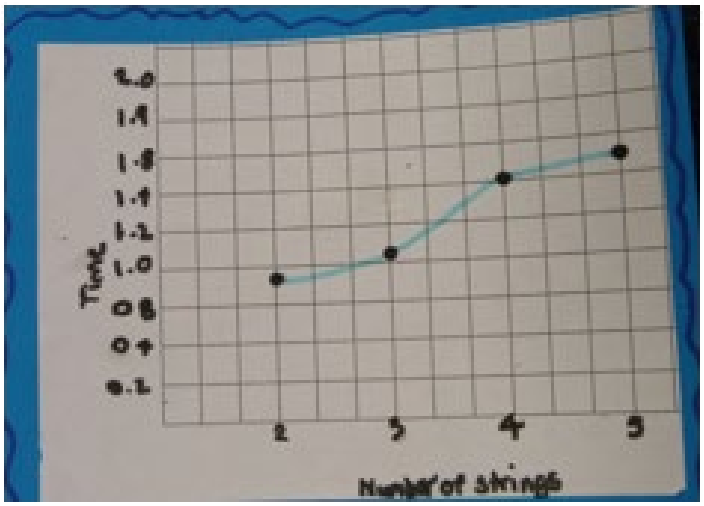
Plans a fair experimental method by identifying the variables to be controlled (height of drop, timing approach).

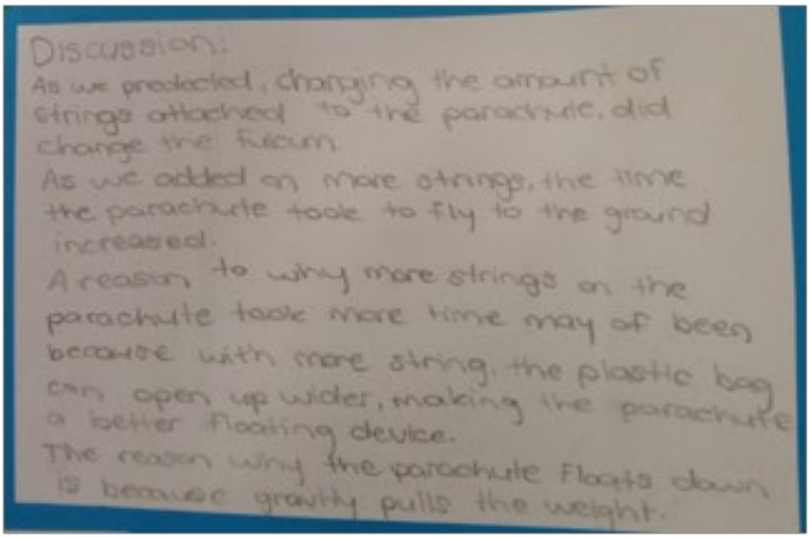
Identifies the variables to be changed and measured.

Investigation poster: Parachute design



No. of strings	Time
2	0.97 sec
3	1.03 sec
4	1.4 sec
5	1.69 sec





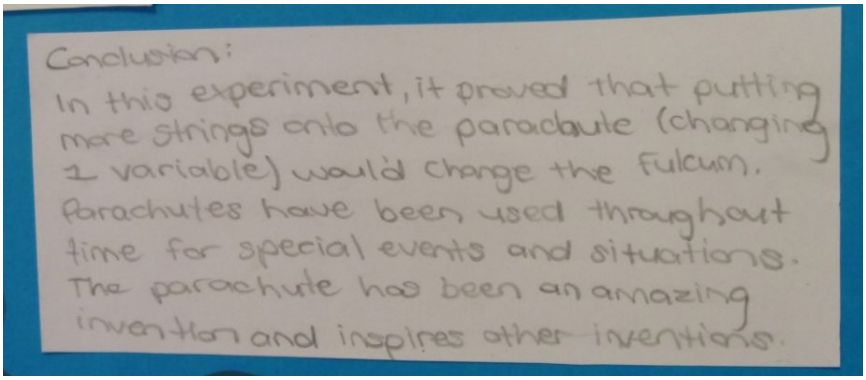
Discussion:
As we predicted, changing the amount of strings attached to the parachute, did change the fulcum.
As we added on more strings, the time the parachute took to fly to the ground increased.
A reason to why more strings on the parachute took more time may of been because with more string, the plastic bag can open up wider, making the parachute a better floating device.
The reason why the parachute floats down is because gravity pulls the weight.

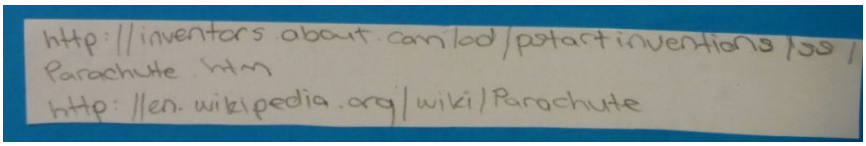
Annotations

Constructs a table to record data, and a graph to represent the trend.

Describes the trend observed and suggests an explanation.

Investigation poster: Parachute design





Annotations

Draws a conclusion based on evidence gathered.

Acknowledges information sources.

Annotations (Overview)

The student communicates methods and findings of a scientific investigation using scientific language and appropriate representations.