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 5 SCIENCE

This portfolio provides the following student work samples:

Sample 1  Worksheet: Solids, liquids, gases
Sample 2  Data analysis: Patterns in the solar system
Sample 3  Investigation report: Bird beaks
Sample 4  Investigation report: Hide and seek
Sample 5  Investigation report: Viscosity
Sample 6  Newspaper article: Australian scientists

In this portfolio, the student classifies a range of common substances as solids, liquids and gases, and demonstrates an understanding of the observable properties and behaviours that enable that classification (WS1). The student describes a number of planets in our solar system and compares them to Earth in terms of size and distance from the sun (WS2). The student investigates different adaptations and explains how structural features relate to function (WS3, WS4). The student investigates the work of two Australian scientists who worked collaboratively and explains how their findings improved people’s lives (WS6).
The student demonstrates the ability to follow teacher instructions, to pose questions for investigation, predict the outcome of changing variables (WS4, WS5) and to use equipment accurately and safely to achieve a desired outcome (WS5). The student collates data in a provided table (WS2, WS3, WS4) and constructs a column graph to organise data and identify patterns (WS3, WS4, WS5), using the data to explain their reasoning (WS2, WS3, WS4). The student describes ways to improve the fairness of investigation methods (WS4, WS5) and communicates ideas, methods and findings using a range of text types (WS2, WS3, WS4, WS5, WS6).
Worksheet: Solids, liquids, gases

Year 5 Science achievement standard

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

By the end of Year 5, students classify substances according to their observable properties and behaviours. They explain everyday phenomena associated with the transfer of light. They describe the key features of our solar system. They analyse how the form of living things enables them to function in their environments. Students discuss how scientific developments have affected people’s lives and how science knowledge develops from many people’s contributions.

Students follow instructions to pose questions for investigation, predict what might happen when variables are changed, and plan investigation methods. They use equipment in ways that are safe and improve the accuracy of their observations. Students construct tables and graphs to organise data and identify patterns. They use patterns in their data to suggest explanations and refer to data when they report findings. They describe ways to improve the fairness of their methods and communicate their ideas, methods and findings using a range of text types.

Summary of task

Students had completed a unit on classifying states of matter (solid, liquid and gas) based on observable properties.

They were required to complete this worksheet as a review of their learning across the unit. They completed the task over one hour in class.
Worksheet: Solids, liquids, gases

Annotations

Classifies common solids and liquids.

Identifies properties of solids, liquids and gases.

Identifies that solids, liquids and gases all have mass.

1. These solids and liquids are all mixed up. Draw an arrow to show which of the materials are liquid and which are solid.

2. Fill in the table by putting a cross (x) in the correct box or boxes:

<table>
<thead>
<tr>
<th></th>
<th>Solid</th>
<th>Liquid</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>e.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Use the words from the list below to complete the sentences:

Word list: heat, solids, freezes, shape, volume, cool, melts

a. Liquids change ………… when you move them in a container.

b. ………… don’t change shape when you move them.
Worksheet: Solids, liquids, gases

Annotations

- Identifies that adding or removing heat can cause a change of state.

- Identifies that all states of matter have particles, mass and take up space and begins to use a particle model to explain difference in states.
Data analysis: Patterns in the solar system

Year 5 Science achievement standard

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

By the end of Year 5, students classify substances according to their observable properties and behaviours. They explain everyday phenomena associated with the transfer of light. They describe the key features of our solar system. They analyse how the form of living things enables them to function in their environments. Students discuss how scientific developments have affected people’s lives and how science knowledge develops from many people’s contributions.

Students follow instructions to pose questions for investigation, predict what might happen when variables are changed, and plan investigation methods. They use equipment in ways that are safe and improve the accuracy of their observations. Students construct tables and graphs to organise data and identify patterns. They use patterns in their data to suggest explanations and refer to data when they report findings. They describe ways to improve the fairness of their methods and communicate their ideas, methods and findings using a range of text types.

Summary of task

Students had investigated models of the solar system, including exploring a digital learning object. They had discussed the types of data that could be gathered about the solar system, and the ways in which patterns in data can assist us in making predictions.

Students were asked to extract and organise a set of data related to the planets in the solar system. As a whole class they constructed a scale model of the solar system on the school oval. They were then provided with a set of questions that prompted them to identify patterns in the data. Students spent one lesson constructing their table from the provided data, another lesson constructing and discussing their scale model, and a final lesson completing the discussion questions.
## Data analysis: Patterns in the solar system

<table>
<thead>
<tr>
<th>Planet</th>
<th>Distance from Sun</th>
<th>Length of Day</th>
<th>Length of Year</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>58 million km</td>
<td>175 Earth days</td>
<td>88 days</td>
<td>48.79 km</td>
</tr>
<tr>
<td>Venus</td>
<td>108 million km</td>
<td>243 Earth days</td>
<td>225 days</td>
<td>12,100 km</td>
</tr>
<tr>
<td>Earth</td>
<td>150 million km</td>
<td>1 Earth day</td>
<td>365 days</td>
<td>12,756 km</td>
</tr>
<tr>
<td>Mars</td>
<td>228 million km</td>
<td>25 hours</td>
<td>666 days</td>
<td>6,780 km</td>
</tr>
<tr>
<td>Jupiter</td>
<td>778 million km</td>
<td>10 hours</td>
<td>12 Earth years</td>
<td>142,984 km</td>
</tr>
<tr>
<td>Saturn</td>
<td>1,677 million km</td>
<td>10 hours</td>
<td>30 Earth years</td>
<td>120,540 km</td>
</tr>
<tr>
<td>Uranus</td>
<td>2,870 million km</td>
<td>17 hours</td>
<td>84 Earth years</td>
<td>51,718 km</td>
</tr>
<tr>
<td>Neptune</td>
<td>4,497 million km</td>
<td>18 hours</td>
<td>165 Earth years</td>
<td>49,528 km</td>
</tr>
</tbody>
</table>

### Annotations

- **Constructs a table to record and organise data collected.**
- **Identifies the planets in the solar system, and that they have varying properties (distance from the sun, day length, year length, diameter).**
Data analysis: Patterns in the solar system

Annotations

Identifies patterns in data by relating two variables, and recognises that year length is related to time taken to orbit the sun.

Observes and describes patterns in the data.

Uses data to answer a research question and provides an explanation with reference to features of the solar system.

Draws on qualitative data to identify additional patterns.

Identifies similarities between planets based on a range of properties.
Data analysis: Patterns in the solar system

Annotations (Overview)

The student communicates ideas and findings using tables, written text and labelled diagrams.

Annotations

Constructs a labelled diagram of the solar system.
Investigation report: Bird beaks

Year 5 Science achievement standard

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

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Students follow instructions to pose questions for investigation, predict what might happen when variables are changed, and plan investigation methods. They use equipment in ways that are safe and improve the accuracy of their observations. Students construct tables and graphs to organise data and identify patterns. They use patterns in their data to suggest explanations and refer to data when they report findings. They describe ways to improve the fairness of their methods and communicate their ideas, methods and findings using a range of text types.

Summary of task

Students had been studying adaptations and the way they could model animal adaptations to make predictions about how those adaptations enabled the animal to survive in their environment.

Students were asked to independently complete an investigation into the relationship between bird beak shape and food size. The investigation required them to model the beak shape of a chosen bird, and see how much of each food type they could collect in 10 seconds. Timing was completed by counting, for example, ‘one thousand and one, one thousand and two’.
Investigation report: Bird beaks

Annotations

Selects a tool to model the beak based on structural properties of the beak.

Records data in a table and calculates summary data.

Constructs a column graph to represent summary data.

Uses data to identify patterns and states a conclusion.

Predicts where the bird might be found, and the type of food it might eat, with reference to data.
Investigation report: Bird beaks

Compare your results with a friend. What conclusions can you make?

I picked pointy tweezers because the woodpecker's beak is pointy. It was the easiest to pick up the pearl barley. My friend used a damp cloth. It didn't pick up many pearl barley. It was better at picking up whole green lentils. I think her bird would be better at picking up big bugs but my bird would be better at picking up small insects. It's possible that both birds may live in the same environment.

Annotations

Explains that different tools were required to model different beak sizes on different birds.

Refers to data to support the prediction that birds with different beak sizes eat different-sized food.

Annotations (Overview)

The student communicates ideas and findings using tables, graphs and written text.
Investigation report: Hide and seek

Year 5 Science achievement standard

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

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Summary of task

The class participated in a brainstorming activity in which they identified the physical adaptations of a range of animals and the advantages of those adaptations. Students then separated into small groups to complete an activity which used coloured small coloured sticks to represent organisms in a range of ‘environments’, such as green grass, leaf matter, soil and sand.

The students reviewed the data collection process as a whole group. They were then asked to graph their data and compare the survival rates of the organisms in each environment. They were also required to apply their findings to various real-world scenarios. The final stage of the activity involved an analysis of the fairness of the investigation and consideration of possible improvements to the investigation.
Investigation report: Hide and seek

Hide and Seek

List three animals and their physical adaptation and how it is important for their survival in the environment.

Remember to state how these adaptations are important:

1. **Cocarabia home in rice field has a thick layer of callouses to keep out mud.

2. **Emperor Penguin has camouflaging so they cannot be seen easily and they have wide beak so they do not have much body hair.

3. **Cormorant has long legs, a fast foot and a long beak so they can use these for reach the bottom of streams to eat.

Investigation:

You will investigate the effect colour can have on the survival of organisms in different habitats. Working in groups of three, one group member will need to scatter the matchsticks and the other two will be the collectors or ‘predators’. You will need to select three different environments or ‘habitats’. For example: green grass; drier grassy area; dirt; sandy ground; concrete; paving; leaf litter; etc. Predict which coloured matchstick or ‘animal’ would have the best chance of surviving in each of your three environments.

Method:

1. Measure out a 2m x 2m area on your selected surface. Mark the corners of the square with sticks or stones. Put string around the corners to mark out the square.
2. One person in the group scatters the matchstick over the marked area.
3. Start the stopwatch and allow the ‘predators’ 15 seconds to find as many matchsticks as they can.
4. Count the number of each colour of matchstick and record this in your data table.
5. Collect all the matchsticks and repeat steps 2-4.
6. Repeat steps 2-5 using other surfaces or environments.

Annotations

Identifies multiple structural features of living things that help them to survive in their environments.
Investigation report: Hide and seek

Hide and Seek

Aim
To find out the effectiveness of the ability to blend in with the environment.

Hypothesis
What do you think will happen? Explain why?
I think that it will definitely matter what color the animal is because if the animal is going to blend in you would not be able to see them. If they were in a field of brown grass they would be easier to camouflage.

Variables
What will be the dependent variable? What are you going to measure?
The rate of survival - how many coloured masqueraders (animals) you select.

What will be the independent variable? What are you going to change?
The concealed factor of the animal.

What variables will you need to control? What will you need to keep the same?
The type of camouflage, number and order, type of matchstick, order of the time you have to collect the signs of the worsening camouflage, and you need to keep the sticks in the same place, away from the wind.

How will you ensure the test is kept fair?
Generalize the variables that need to be controlled across trials and average the results.
Investigation report: Hide and seek

## Hide and Seek

### Surface 1

<table>
<thead>
<tr>
<th>Colour of Match-stick</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Average</th>
<th>% picked up</th>
<th>% Survived</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>++++</td>
<td>++++</td>
<td>7</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Red</td>
<td>++++</td>
<td>++++</td>
<td>8.5</td>
<td>85%</td>
<td>15%</td>
</tr>
<tr>
<td>Green</td>
<td>++++</td>
<td>++++</td>
<td>6.5</td>
<td>65%</td>
<td>35%</td>
</tr>
<tr>
<td>Brown</td>
<td>++++</td>
<td>++++</td>
<td>7</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Blue</td>
<td>++++</td>
<td>++++</td>
<td>8</td>
<td>80%</td>
<td>20%</td>
</tr>
</tbody>
</table>

### Surface 2

<table>
<thead>
<tr>
<th>Colour of Match-stick</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Average</th>
<th>% picked up</th>
<th>% Survived</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>++++</td>
<td>++++</td>
<td>6.5</td>
<td>65%</td>
<td>35%</td>
</tr>
<tr>
<td>Red</td>
<td>++++</td>
<td>++++</td>
<td>7</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Green</td>
<td>++++</td>
<td>++++</td>
<td>6</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>Brown</td>
<td>++++</td>
<td>++++</td>
<td>5.5</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>Blue</td>
<td>++++</td>
<td>++++</td>
<td>6</td>
<td>60%</td>
<td>40%</td>
</tr>
</tbody>
</table>

### Surface 3

<table>
<thead>
<tr>
<th>Colour of Match-stick</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Average</th>
<th>% picked up</th>
<th>% Survived</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>++++</td>
<td>++++</td>
<td>6.5</td>
<td>65%</td>
<td>35%</td>
</tr>
<tr>
<td>Red</td>
<td>++++</td>
<td>++++</td>
<td>7</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Green</td>
<td>++++</td>
<td>++++</td>
<td>6.5</td>
<td>65%</td>
<td>35%</td>
</tr>
<tr>
<td>Brown</td>
<td>++++</td>
<td>++++</td>
<td>7</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Blue</td>
<td>++++</td>
<td>++++</td>
<td>8</td>
<td>80%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Annotations

Records and processes data in a provided table.
Investigation report: Hide and seek

Hide and Seek

Follows graphing conventions to construct graphs of summary data.
Investigation report: Hide and seek

Hide and Seek

Percentage of Survival in Dirt Environment

<table>
<thead>
<tr>
<th>Colour of Matchsticks</th>
<th>Survival (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown</td>
<td>90</td>
</tr>
<tr>
<td>Blue</td>
<td>80</td>
</tr>
<tr>
<td>Green</td>
<td>70</td>
</tr>
<tr>
<td>Yellow</td>
<td>60</td>
</tr>
<tr>
<td>Red</td>
<td>50</td>
</tr>
</tbody>
</table>

Annotations
Investigation report: Hide and seek

Hide and Seek

Percentage of Survival (%) in Sand Environment

<table>
<thead>
<tr>
<th>Colour of Matchsticks</th>
<th>Percentage of Survival (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>25</td>
</tr>
<tr>
<td>Green</td>
<td>30</td>
</tr>
<tr>
<td>Brown</td>
<td>20</td>
</tr>
<tr>
<td>Red</td>
<td>15</td>
</tr>
<tr>
<td>Blue</td>
<td>10</td>
</tr>
</tbody>
</table>

Annotations
Investigation report: Hide and seek

Hide and Seek

Compare the survival rate for the different environments. Why do you think there is a difference in survival rates?

Because animals like the brown would camouflage well whereas end the animal colours like the reds and blues were bright and easy to see because the environments didn’t hide the well.

Imagine that an animal population, featuring the five colours you investigated, were in the same environments with the same ‘predators’. What do you think would happen to this population over time. Give reasons for your prediction.

The animals that could camouflage like the brown would not get eaten by the predators and would have babies. And the red colours that could not camouflage would eventually die out because the predators would eat them before they could reproduce.

Now imagine that a bushfire had passed through each environment. Assume that many of the ‘matchstick’ creatures survived the fire. Explain what you now think would happen to the population.

The bushfire would destroy the animal’s habitat so they could not be able to camouflage well and there would also be no food or water so they would die out and if they were like a camel they would still be eaten by predators because they could be seen.

Using your results, what can you say about the effect of colour on the survival of organisms in a particular habitat?

The animals have more chance of surviving if they can camouflage and cannot be seen easily by predators.

Annotations

Identifies that survival rate reflects a relationship between prey colour and environment colour.

Uses an understanding of the process of natural selection to predict what would happen to a population over time.

Uses understanding of animal camouflage to predict the effect of environmental change on a population over time.

States a conclusion related to the data collected.
Investigation report: Hide and seek

Hide and Seek

Scientists look to nature for solutions to problems. Where and how do you think scientists could use the information you have gathered? What ‘problems’ could be solved? Give examples.

They could use it to see what animals have a chance of becoming endangered or extinct faster than other animals without being noticed.

Was this a fair test? No. Why / why not?

It was not a fair test because the matchsticks were the same colour except for the brown and because they animals would not have the advantage of the brown matchsticks to really see the sticks.

Were there any problems that you encountered during the investigation?

Yes, there were, because in the dirt and sand you would lose the sticks especially the matchsticks because when you walked on it you would bury the sticks.

Explain how do you think this investigation could be improved?

I think that if the colour were of the matchsticks was more flat and that they could sometimes move around.

Annotations

Identifies how scientists could apply knowledge of camouflage to the study of endangered species.

Identifies limitations of the analogy (colour of sticks, lack of movement) and issues with the method as impacting on the fairness of the test.

Suggests improvements to address problems in the method.

Annotations (Overview)

The student communicates ideas, methods and findings through tables, graphs, written text and annotated diagrams.
Investigation report: Viscosity

Year 5 Science achievement standard

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

By the end of Year 5, students classify substances according to their observable properties and behaviours. They explain everyday phenomena associated with the transfer of light. They describe the key features of our solar system. They analyse how the form of living things enables them to function in their environments. Students discuss how scientific developments have affected people’s lives and how science knowledge develops from many people’s contributions.

Students follow instructions to pose questions for investigation, predict what might happen when variables are changed, and plan investigation methods. They use equipment in ways that are safe and improve the accuracy of their observations. Students construct tables and graphs to organise data and identify patterns. They use patterns in their data to suggest explanations and refer to data when they report findings. They describe ways to improve the fairness of their methods and communicate their ideas, methods and findings using a range of text types.

Summary of task

Students had been investigating the properties of liquids and the characteristics of a fair test. They participated in a brainstorming activity in which they identified a number of different liquids and discussed how the liquids could be categorised based on their properties.

Students were asked to work in small groups to investigate the viscosity of the liquids. Students were given a variety of liquids and asked to predict which ones would flow easily and which would not. They were then asked to plan an investigation to test their prediction about the viscosity of each liquid. Students were required to identify the dependent, independent and controlled variables, and consider how they could ensure that their tests were fair and the number of tests they would perform. They were also asked to determine how they would tabulate their data.

Following analysis of their individual results, students participated in a class discussion and compared their results with those of other groups. Students were asked to account for any differences and to suggest ways to improve the investigation.
Investigation report: Viscosity

Viscosity

What do you know about liquids? In the space below write as many words as you can that describe liquids.
- liquids
- transparent
- fluid
- sticky
- wet
- flowing
- funny
- gooey
- squishy
- splathy
- dripping

Different liquids have different properties. Today you are going to be investigating the viscosity of liquids. Viscosity is a liquid’s resistance to flowing. Not all liquids are the same. Some are thin and flow easily; these have a low viscosity. Others are thick and gooey and have a high viscosity.

Aim
Compare the rate of flow for a variety of liquids and classify them according to their viscosity.

Hypothesis
What do you think will happen? Explain why.
- I think the low viscosity liquids will slide/run down the paper faster than the high viscosity liquids.

Variables
What will be the dependent variable? What are you going to measure?
- We are going to measure the distance the drops travel.

What will be the independent variable? What are you going to change?
- the type of liquid

What variables will you need to control? What will you need to keep the same?
- time, how many drops of liquid

Annotations

Identifies properties and behaviours of liquids.

Makes a prediction related to knowledge of the property of viscosity.

Identifies the variable to be measured and changed, and some variables to be controlled.
Investigation report: Viscosity

Viscosity

Investigation Sequence:
1. One group member collects equipment, set up in a cleared area.
2. Put an equal amount (two or three drops) of each liquid at the top of your race sheets.
3. Start the timer as the card is carefully lifted to rest on overturned bookend (use some Blutack® to keep the card in place.)
4. Record how far the droplet travels in 15 seconds.
5. Repeat steps 2 to 4 two more times.

How will you be sure that you have completed a fair test?

You have have to keep the variables the same.

Safety

What are the potential risks with this investigation and how will you ensure you and your team members are using the equipment safely.

Change the pipette everytime, don’t drink it because you don’t know what it is and you could get sick.

Distance Travelled in 15 Seconds

<table>
<thead>
<tr>
<th>Liquid</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dishwashing Liquid</td>
<td>10 mm</td>
<td>10 mm</td>
<td>10 mm</td>
<td>4 mm</td>
</tr>
<tr>
<td>Olive Oil</td>
<td>40 mm</td>
<td>30 mm</td>
<td>40 mm</td>
<td>36.6 mm</td>
</tr>
<tr>
<td>Milk</td>
<td>290 mm</td>
<td>290 mm</td>
<td>290 mm</td>
<td>290 mm</td>
</tr>
<tr>
<td>Water</td>
<td>290 mm</td>
<td>290 mm</td>
<td>290 mm</td>
<td>290 mm</td>
</tr>
<tr>
<td>Glucose</td>
<td>0 mm</td>
<td>0 mm</td>
<td>0 mm</td>
<td>0 mm</td>
</tr>
</tbody>
</table>

Annotations

Identifies that a fair test must keep some variables the same.

Identifies ways to use equipment safely.

Constructs a table to record quantitative data and provides summary data (average distance travelled).
Investigation report: Viscosity

An annotations

Follows graphing conventions to construct a graph of summary data, including correct units.
Investigation report: Viscosity

Viscosity

Using your results, compare the rate of flow for the different liquids. Which liquids have a high viscosity, which have a low viscosity? Why?

I think the water and milk have low viscosity because they just zoomed down the page and the olive oil, dishwashing liquid and the glucose were high viscosity because they didn't go down the page as far because they were too thick.

Compare your results with those of another team. How were they similar, how were they different?

Many people got 29 cm for water because it is a low viscosity and many people got zero for glucose because it is a high viscosity.

Explain why might there be a difference in the two sets of results?

Maybe because the other team started the timer early or they put more drops on the page.

Was this a fair test? No. Why/why not?

Because most people put more than 3 drops on the page.

Were there any problems that you encountered during this investigation?

No, there were no problems.

Explain how do you think this investigation could be improved?

I think it could be improved by adding more time for the drops to come down so they would all fall come down a bit further.

Annotations

Uses data collected to classify liquids according to level of viscosity.

Identifies similarities in class results.

Identifies sources of human error that could cause variation in the data.

Identifies variations in method that meant that the aggregated class results did not reflect a fair test.

Identifies an improvement to the method based on an identified problem.

Annotations (Overview)

The student communicates ideas, methods and findings through tables, graphs and written text.
Newspaper article: Australian scientists

Year 5 Science achievement standard

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

By the end of Year 5, students classify substances according to their observable properties and behaviours. They explain everyday phenomena associated with the transfer of light. They describe the key features of our solar system. They analyse how the form of living things enables them to function in their environments. Students discuss how scientific developments have affected people’s lives and how science knowledge develops from many people’s contributions.

Students follow instructions to pose questions for investigation, predict what might happen when variables are changed, and plan investigation methods. They use equipment in ways that are safe and improve the accuracy of their observations. Students construct tables and graphs to organise data and identify patterns. They use patterns in their data to suggest explanations and refer to data when they report findings. They describe ways to improve the fairness of their methods and communicate their ideas, methods and findings using a range of text types.

Summary of task

As part of a unit on micro-organisms as living things, students explored the role of research in building our knowledge and understanding of bacteria and the ways these micro-organisms impact our lives. Students viewed a video about the work of Barry Marshall and Robin Warren and, as a class, they created a timeline that showed the major events in their work on stomach ulcers.

Students were asked to write a newspaper article about Barry Marshall and Robin Warren’s work. They were provided with a pro forma for the article and were required to include the following:

- a catchy headline for the article
- a description of what the scientists did
- a description of why their work is important.
Newspaper article: Australian scientists

Science news

Scientist drinks bacteria and wins Nobel Prize!

By

Barry Marshall is a doctor from Perth. He won the 2005 Nobel Prize with Robin Warren for finding out what causes stomach ulcers.

About 10% of adults get stomach ulcers. Stomach ulcers cause nausea and vomiting. Before Barry Marshall found out what caused stomach ulcers, lots of people actually died from them.

Lots of people thought that stomach ulcers were caused by stress, but Barry Marshall thought they were caused by bacteria.

He worked with another pathologist from the Royal Perth Hospital, Robin Warren to see if they could find out what caused stomach ulcers. They found out that there actually bacteria in the stomach and thought that antibiotics could probably cure stomach ulcers.

Barry Marshall needed to get proof that his ideas were true. But he couldn’t give people stomach ulcers on purpose! So instead he gave himself stomach ulcers. He drank the bacteria and got an ulcer.

He took a piece out of his own stomach and proved that the bacteria were there causing the problem.

Now people who get stomach ulcers can take antibiotics and get cured.

Now Barry Marshall is working on flu vaccines.

Annotations

Recounts information about the scientist and his work.

Links the science to the treatment of disease in society and indicates how science has made a difference to people’s lives.

Illustrates the collaborative nature of the work.

Annotations (Overview)

The student communicates ideas through written text in the genre of a newspaper article.