Science

Year 5

Below 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 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

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).

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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 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 (WS4, WS5, WS6), 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).

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.*
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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

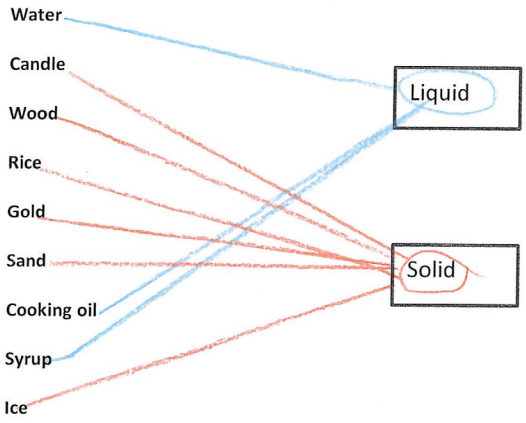
Students had completed a unit on classifying states of matter (solid, liquid and gas) based on observable properties.

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

Solids, liquids and gases

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**:

	Solid	Liquid	Gas
a. It fills the shape of its container	X	X	
b. It stays the same shape	X		
c. The air around us is made of this			X
d. If you freeze a liquid it will become a...			X
e. If you boil water it will become a...	X		
f. It has weight	X		

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

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

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

b. ..... solids ..... don't change shape when you move them.

Annotations

Classifies common solids and liquids.

Identifies some properties of solids and liquids.

Identifies that solids have weight.

Worksheet: Solids, liquids, gases

c. Moving a liquid from a bottle to a glass does not change its ...Volume...

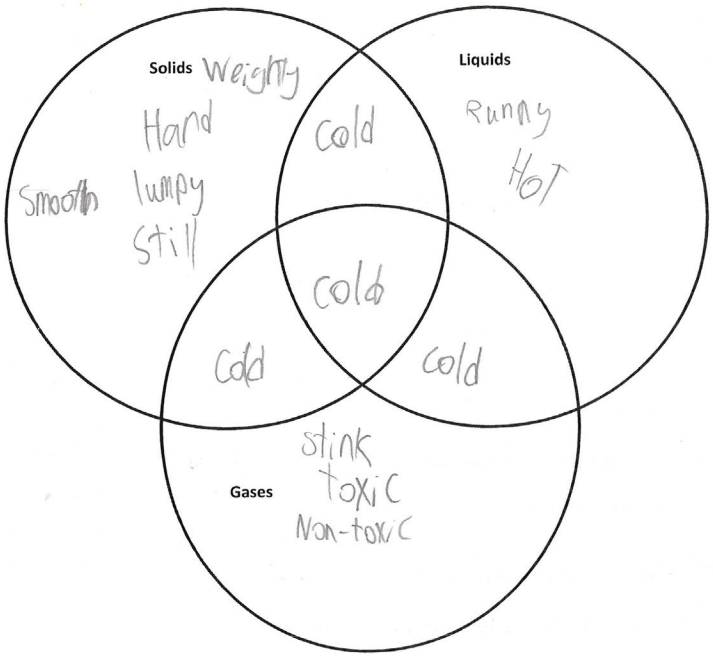
d. When a solid ...melts... it turns into a liquid.

e. When a liquid ...freezes... it turns into a solid.

f. To turn a solid into a liquid, you must ...heat... it.

g. To turn a liquid into a solid, you must add ...freezes...

4. Complete the Venn diagram below to show as much as you know about solids, liquids and gases. Remember to use the overlapping parts of the diagram to show what they have in common.



Annotations

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

Identifies some observable properties of solids, liquids and gases.

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.

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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

Solar System Planets

Planets	Distance from Sun	Length of a day	Length of a year	Diametre
Mercury	58 million Kilometres	176 days earth	88 days	4,879 KM
Venus	108 million Kilometres	243 days Earth	225 days	12,100 km
Earth	150 million Kilometres	24 hours	366 days	12,756 km
Mars	228 million Kilometres	25 hours	686 days	6780 km
Jupiter	778 million Kilometres	10 hours	12 years on earth	142,984 km
Saturn	1427 million Kilometres	10 hours	30 years	120,540 km
Uranus	2,870 million kilometres	17 hours	84 years	51,118 km
Neptune	4,497 million kilometres	18 hours	165 years on earth	49,528 km

I ♥ A U S

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).

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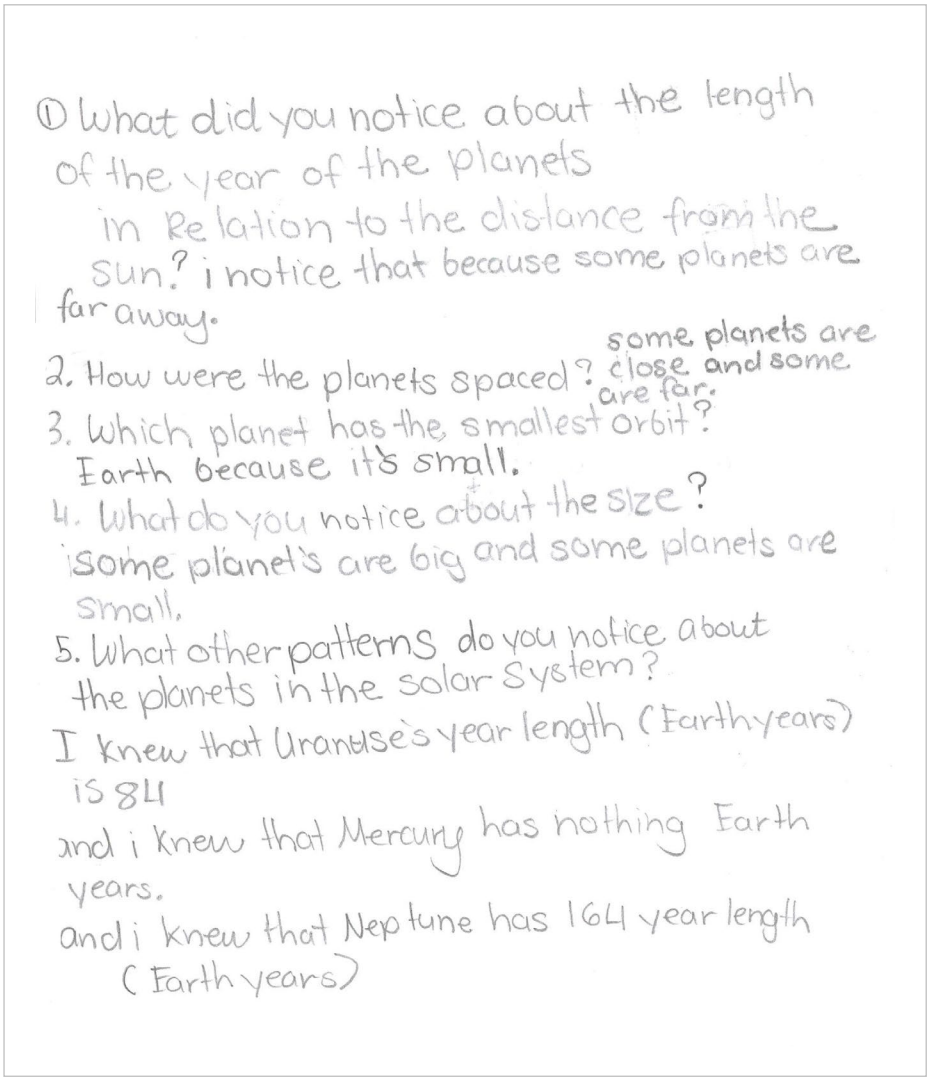
Data analysis: Patterns in the solar system



① What did you notice about the length of the year of the planets in Relation to the distance from the sun? i notice that because some planets are far away.

2. How were the planets spaced? some planets are close and some are far.

3. Which planet has the smallest orbit? Earth because it's small.

4. What do you notice about the size? some planet's are big and some planets are small.

5. What other patterns do you notice about the planets in the solar System?

I knew that Uranuse's year length (Earth years) is 84

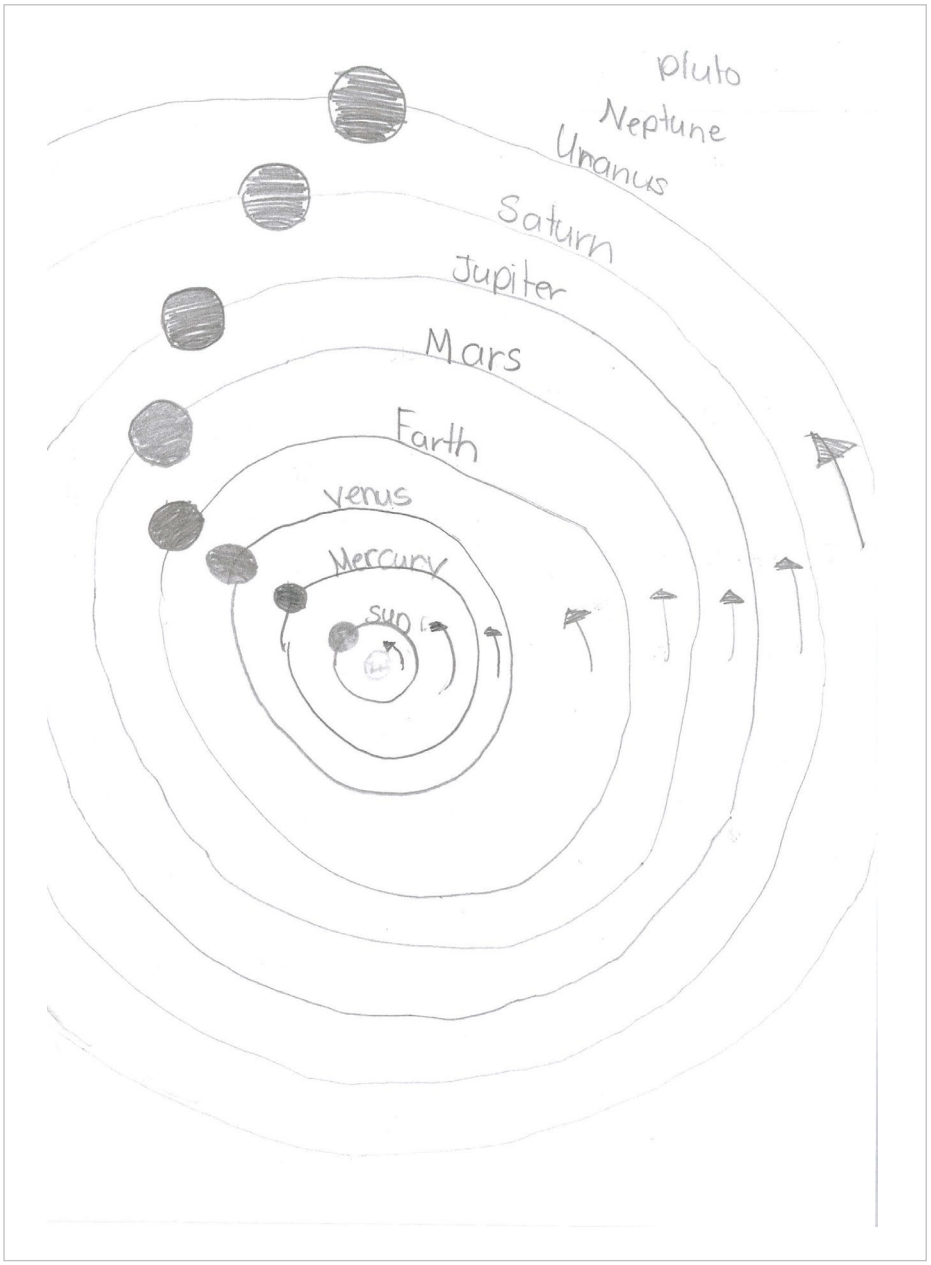
and i knew that Mercury has nothing Earth years.

and i knew that Neptune has 164 year length (Earth years)

Annotations

Identifies variation in the data.

Data analysis: Patterns in the solar system



Annotations

Constructs a labelled diagram of the solar system.

Annotations (Overview)

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

Investigation report: Bird beaks

Year 5 Science achievement standard

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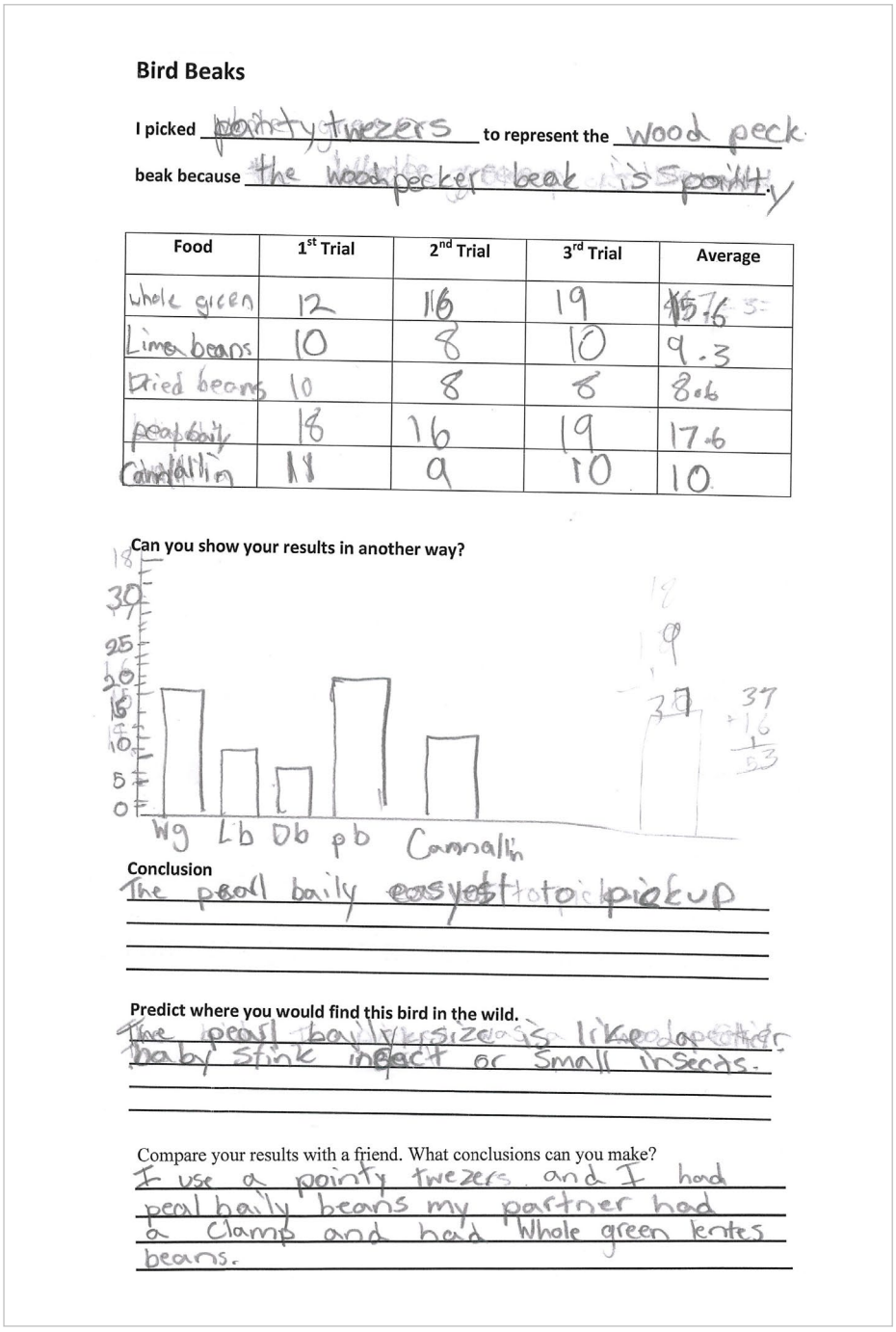
Summary of task

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



Bird Beaks

I picked pointy tweezers to represent the wood peck beak because the woodpecker beak is spointy.

Food	1st Trial	2nd Trial	3rd Trial	Average
whole green	12	16	19	15.6
Lima beans	10	8	10	9.3
Fried beans	10	8	8	8.6
pearl baily	18	16	19	17.6
Camalin	18	9	10	10

Can you show your results in another way?

Conclusion

The pearl baily easyest to pick pick up

Predict where you would find this bird in the wild.

The pearl baily size is like a baby stink insect or small insects.

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

I use a pointy tweezers and I had pearl baily beans my partner had a clamp and had whole green kintes beans.

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.

States a conclusion based on data collected.

Predicts what type of food the bird might eat.

Identifies that different tools were used to model beak sizes and that they produced different results.

Annotations (Overview)

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

Investigation report: Hide and seek

Year 5 Science achievement standard

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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 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. Camels store fat so when there is no food they have something to eat.
2. Crocodiles have skin coloured like a log it makes pray think ~~they~~ its a log
3. Lions have soft paws so they can creep up on their pray.

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 scatterer the match-sticks 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 structural features of living things that help them to survive in their environments.

Investigation report: Hide and seek

Hide and Seek

Aim

The aim is to find out if the colour of an animal effects its survival in a particular habitat.

Hypothesis

What do you think will happen? Explain why?

Yes because if a predator can't see them because they are camaflage they wont get eaten.

Variables

What will be the dependent variable? ***What are you going to measure?***

The rate of survival.

What will be the independent variable? ***What are you going to change?***

Change the environment

What variables will you need to control? ***What will you need to keep the same?***

The colour of animals, The same number, and The type of matchstick. That the chop sticks in the area, use only one hand, size of the area

How will you ensure the test is kept fair?

That no one pushis, no one steels chop sticks. no fighting over who is the scatterer, no one puts the chop sticks in one place.

Annotations

Identifies variables to be measured, changed and controlled.

Identifies that self-management is required to ensure a fair test.

Investigation report: Hide and seek

Hide and Seek

Surface 1 Grass

Colour of Match-stick	Test 1	Test 2	Average	% picked up	% Survived
Yellow	6	8	7	70%	30%
Red	7	15	8.5	85%	15%
Green	6	7	6.5	65%	35%
Brown	4	10	7	70%	30%
Blue	8	8	8	80%	20%

Surface 2 dirt

Colour of Match-stick	Test 1	Test 2	Average	% picked up	% Survived
Yellow	6	7	6.5	65%	35%
Red	6	8	7	70%	30%
Green	4	8	6	60%	40%
Brown	8	3	5.5	55%	45%
Blue	6	6	6	60%	40%

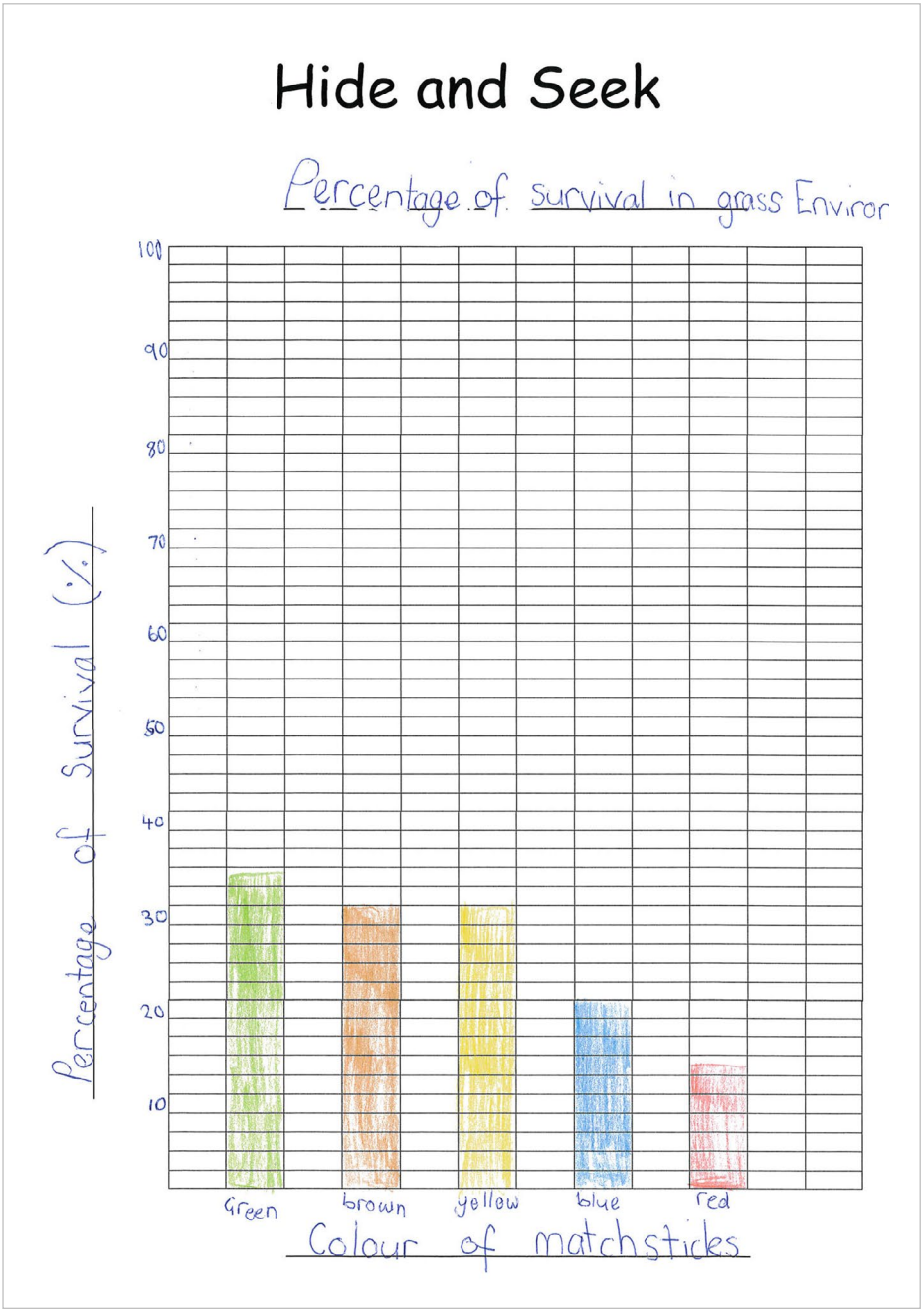
Surface 3 Sand

Colour of Match-stick	Test 1	Test 2	Average	% picked up	% Survived
Yellow	5	8	6.5	65%	15%
Red	4	10	7	70%	30%
Green	8	5	6.5	65%	15%
Brown	7	7	7	70%	30%
Blue	8	7	8	80%	26%

Annotations

Records and processes data in a provided table.

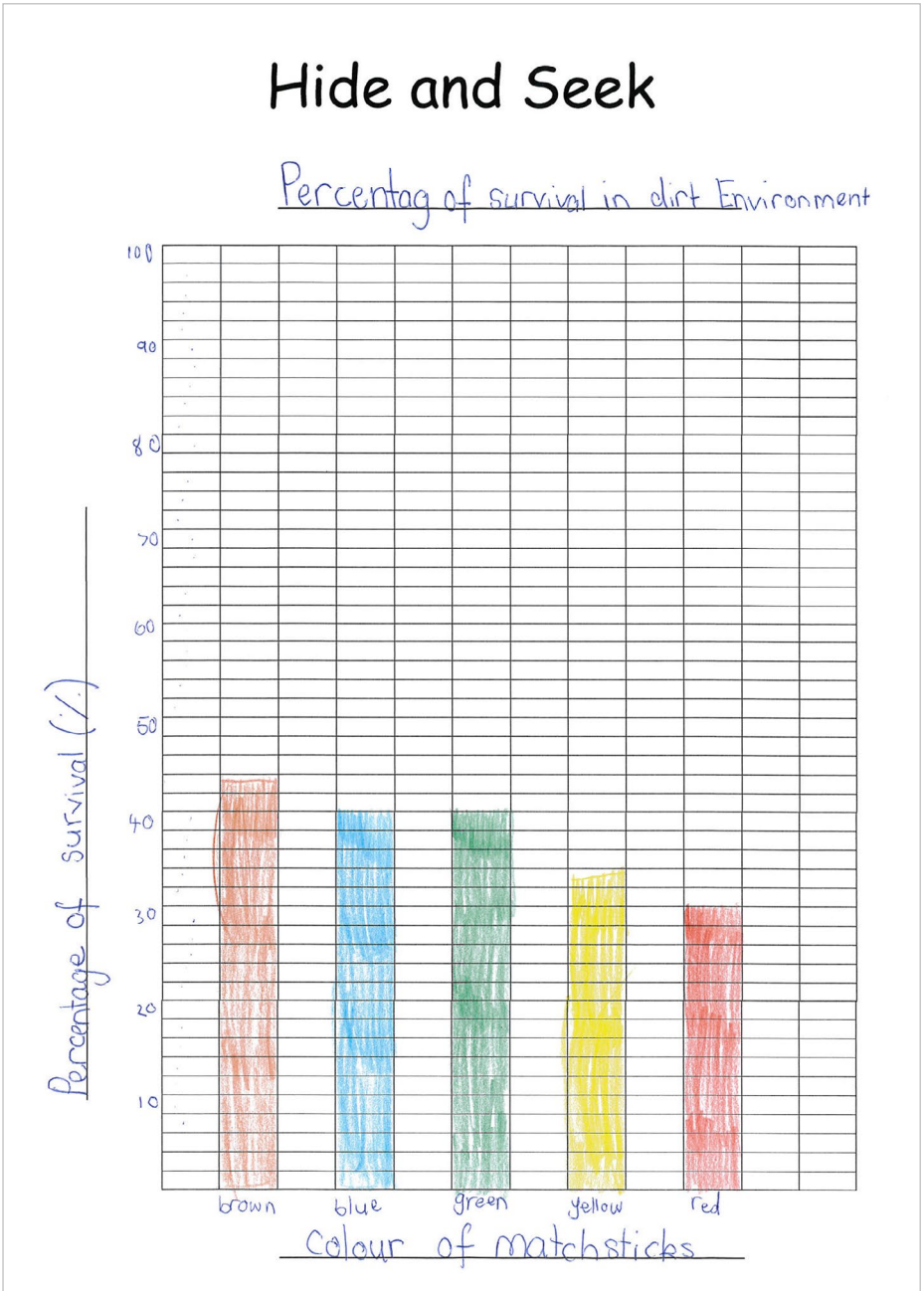
Investigation report: Hide and seek



Annotations

Follows graphing conventions to construct graphs that mostly correspond with collected data.

Investigation report: Hide and seek



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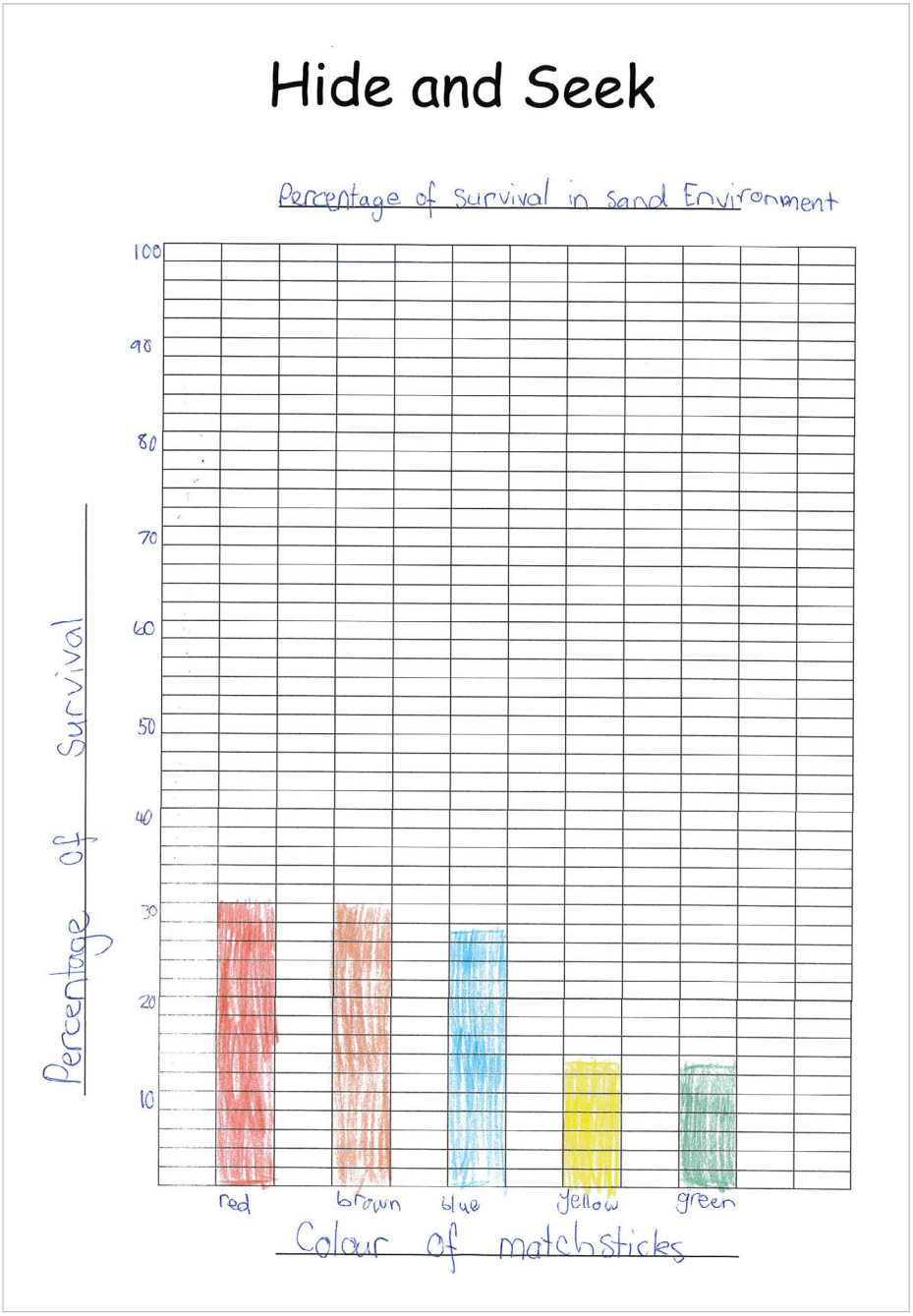


Annotations

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?

I think there is a different survival rate because ~~if~~ different colours stand out more then others so then predators can see them more. Than others

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.

I think the population of the colours will run out and become extinced or over the years the colours will tern into something else.

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.

I think there habitat will be burnt so then predators will easly find them and then they will turn ~~extinced~~ extinced.

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

I think animals will survival if it lives in a habitat that is the same colour as them.

Annotations

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

Makes a prediction based on knowledge unrelated to the investigation.

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

States a conclusion.

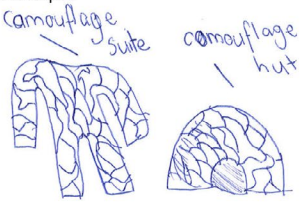
Investigation report: Hide and seek

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.

Scientists ~~Cotti~~ could make a masive zoo for animals to run around and survival or you could make a camouflage suit and a hut so then they can watch the animals and see how to improve on their survival.

Draw an example.



Was this a fair test? yes (Why) why not?

because the sticks got scatterd evenly so no one hid them.

Were there any problems that you encountered during this investigation?

Sometymes we couldent find all fifty matchsticks after ~~t~~ we ~~did~~ did the hunt.

Explain how do you think this investigation could be improved?

This investagation could improve by having 30 secs instead of 15 seconds.

Annotations

Identifies how scientists could use camouflage to study animals.

Suggests a change to 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

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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.

Wet, runny, fluid, take on the shape of container, sticky, squishy, dripping, flowing, smooth, gooey, splashy, opaque,

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 will go faster down the board than the high viscosity because the ~~high~~ viscosity is heavier than the low viscosity.

Variables

What will be the dependent variable? ***What are you going to measure?***

We are going to ~~measure~~ measure the distance of the dropstra

What will be the independent variable? ***What are you going to change?***

We are going to change the liquid.

What variables will you need to control? ***What will you need to keep the same?***

We are going to keep the amount of liquid and the amount of time to drop down the board.

Annotations

Identifies properties and behaviours of liquids.

Makes a prediction.

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?

I know its going to be fair by the control of the liquids.

Safety

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

I think to not be too silly.

Distance Travelled in 15 Seconds

Water	Glucose	Milk	Dishwashing Liquid	Olive Oil
260	0	20	20	70
260	0	260	30	80
260	0	50	10	30
Average	Average	Average	Average	Average
260	0	110	20	60

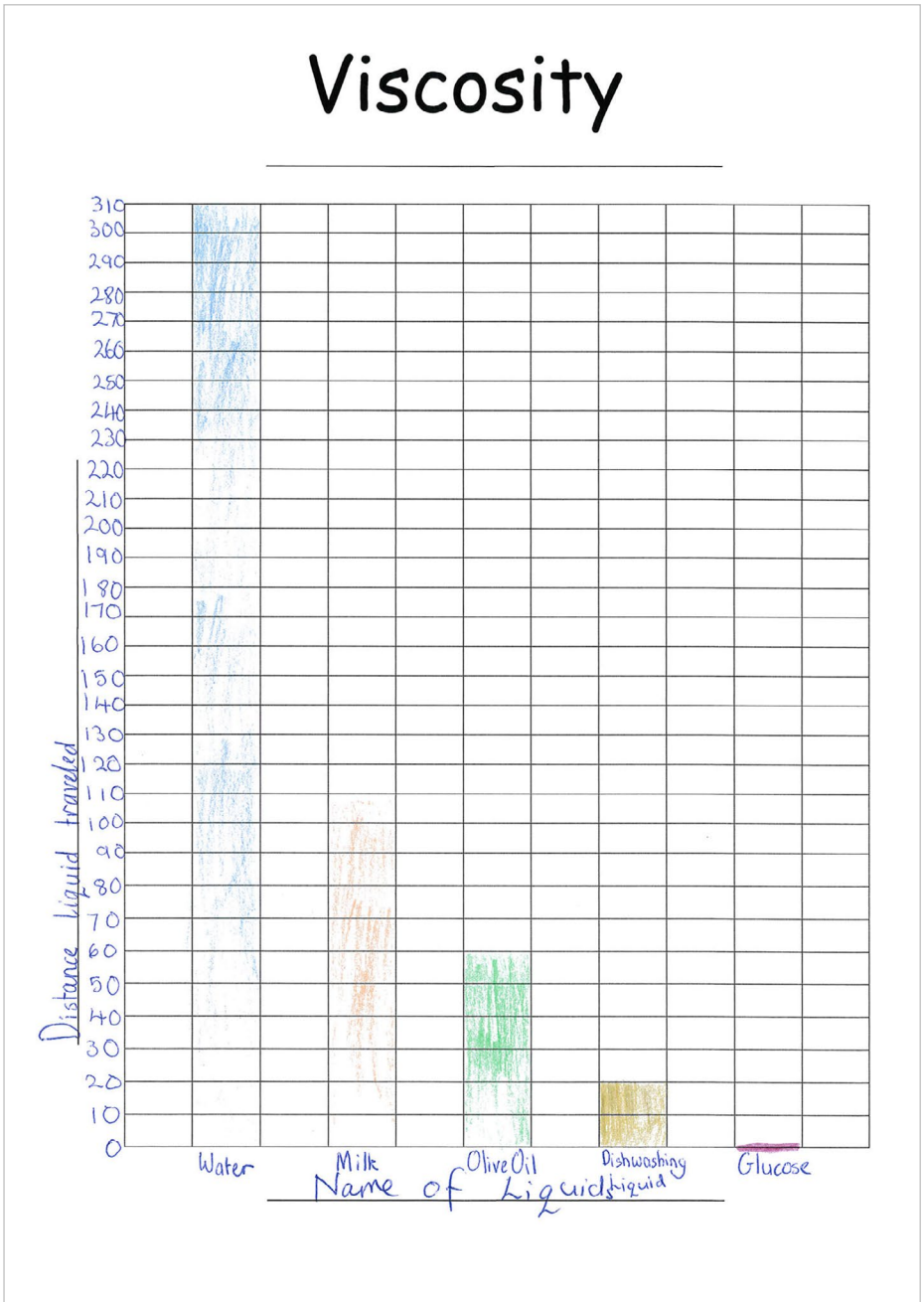
Annotations

Identifies controlled use of materials as important in a fair test.

Identifies self-management as important to safety.

Constructs a table to record quantitative data and summary data (average distance travelled).

Investigation report: Viscosity



Annotations

Follows some graphing conventions to construct a graph of summary data.

Science

Year 5

Below satisfactory

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?

The high viscosity are the dishwashing liquid and the glucose because they are heavy and thick where as the low viscosity are the water and milk because they are more runny and fleavy.

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

The results weren't very ~~differend~~ different because everyone controlled their liquids and made ~~if a~~ it a fair test.

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

I think there is ~~different~~ difference between the 2 results because some put less or more liquid one the laminated sheet.

Was this a fair test? Yes (Why) / why not?

because everyone controlled their liquids.

Were there any problems that you encountered during this investigation?

No, because we all worked together as a team even though there were some road bumps.

Explain how do you think this investigation could be improved?

I think the investagion would be improved by having more equiptment for the investagetion.

Annotations

Uses qualitative observations to compare viscosity of liquids.

Makes a general statement about similarity in class results.

Suggests a general improvement to the method.

Annotations (Overview)

The student communicates ideas, methods and findings through tables, graphs and written text.