

Sample Information

Subject	Science		
Strand/Topic	Chemical sciences investigation		
Task	Investigating the properties affecting the use of ochre		
Year/Class	4X	Date	18/11/2021

Teacher Name Kerenza/Lenore

Overall grade A B C **D** E

Summary justification

The student has demonstrated a mix of scientific understanding with general knowledge and communicated mainly through informal everyday language.

Strengths of the performance

The student has demonstrated that they can complete a sentence to describe their prediction and provide a reason for their prediction. Within their attempt to craft an investigation question, they have identified the variable they are measuring. They have identified potential risks in terms of the materials and their conduct during the experiment. Throughout the response, they have referred to the variable that they are collecting data on, i.e., 'smudge'.

They have used different terms to describe the properties of materials, such as, smooth, runny, sticky, lumpy, bumpy, lighter, gooey. In the analysis, they have referred to some of those terms and used the word, 'properties'. They've referred to their common understanding of some of these materials and on the impact this will have. For example, they've drawn on their experience of working with glue and their knowledge that glue will dry hard to predict it will be the best material in terms of smudge resistance.

Areas for improvement

The student requires further support to craft an investigation question and identify a method for data collection using provided scaffolds.

The recording of observations should be structured using a similar sequence for each test to show commonalities and make comparisons. For example, in this task, observations could be described in terms of stickiness, texture, ability to move material down the page. Quantitative data could also be incorporated using diagrams showing where the smudge is and a measurement. Diagrams have been used only once in this response. Scales could also be used, for example, from 0 (no smudge) to 5 (greatest amount of smudge).

In the analysis, the data has been discussed generally with no specific reference to smudge resistance and the type of mixture used in the comparison of samples. Reasons for the differences in the observed samples have not been provided. For example, while it has been identified that oil and water were the only ones that looked the same, there isn't a description of what features were the same. The collected scientific data needs to be used in explanations. For example, rather than drawing on everyday understanding of how glue acts, the data shows that other samples operated similarly, but this hasn't been incorporated in the explanation.

Next steps for teaching

Focus will be on developing scientific language through building on everyday descriptive words (e.g., 'runny') to more scientific words (e.g., 'fluid', 'viscosity'). Word walls will be used to show the build from everyday to scientific words.

Scaffolding will be provided to support the student to think further about different aspects of questions. For example, asking about the properties of the observed materials followed by how those properties relate to use.

Assessment task — Investigating properties affecting the use of ochre

Name

Class

Teacher

Date

Part A: Investigating ochres

Read the assessment task *Investigating properties affecting the use of ochre: Student resource 1 (Background information)* to understand the assessment task.

You will investigate what happens to the physical properties of the ochre when different liquids are added. Decide which property you will be measuring:

Planning

Measure

Tick the physical property you will measure:

- water fastness (after it has dried, does the ochre mixture run when water is dropped on it?)
- smudge resistance (after it has dried, does it smudge when rubbed?)

Change

Change the type of liquid mixed with the ochre: water, egg yolk, PVA glue, cooking oil.

Keep the same

- type of ochre
- size of particles
- drying time
- the surface
- amount of paint tested
- thickness of mixture

Investigation question

What happens to the ochre that has the most smudge resistant
(measure)

when I change the type of liquid mixed with the ochre?

(change)

Prediction

Circle the variable to be measured and a liquid for your prediction.

I predict that the ochre paint will have the best water fastness / smudge resistance when water / egg yolk / PVA glue / cooking oil is used as the liquid mixer (binder)

because glue when it sets, it goes hard and when mixed with ochre, it will do the same thing

Materials and method

Read the assessment task *Investigating properties affecting the use of ochre: Student resource 2 (Materials and method)* to:

- identify what materials you will need.
- select a method to follow.

Method A

Method B

Explain your reasons for selecting this method.

Oil, Ochre, water, PVA glue, cotton buds.

Safety

Identify any potential safety risks and suggest how these risks could be reduced.

Potential risk	How risk can be reduced
• Egg allergies	• Do not use egg.
• Other allergies	wash your hands after using
• spills	stay a distant away
• touch accidentally	go to sick bay, or go home and get treated
• smell	ask a teacher to do it for you.

Submit your investigation plan for approval. Wait until your plan has been approved before conducting the investigation.

- The method selected matches the investigation question.
- This method is safe and practical.
- It has been approved and any necessary changes have been made.

Signed by teacher:..... Date:.....

Now you can conduct the investigation.

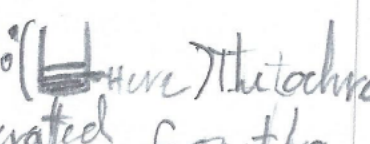
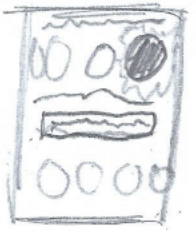
Use the assessment task *Investigating properties affecting the use of ochre: Student resource 3 (Ochre mix test page)* for your ochre paint samples (method steps 1–10).

Recording observations

Use the table below to record your observations.

I am testing smudge resistance.....

Ochre mixture	Observations			
	Mixing	Applying to test page	Test 1 when dry	Test 2 when dry
with water	It felt easy to mix, looked like coffee. Wasn't thick just smooth and runny.	Easy to spread, just spread on its own. Really wet.	The water looks smooth, the water with ochre felt smooth and the smudge was okay	Same in test 2 but it was dark. The smudge was even lighter
with PVA glue	Hard to stir. Ridgid, gooey, and bumpy. Not easy to dissolve.	The cotton bud stuck on and was really sticky and lumpy.	It looks bumpy and slightly light. The Pva glue was the most smudge resistant!	On the other one it looked really dark, and bumpy. Nothing at all the Pva glue <u>still</u> survive the smudge. :-)

Ochre mixture	Observations			
	Mixing	Applying to test page	Test 1 when dry	Test 2 when dry
with egg yolk	When I mixed it, it felt gooey and hard to mix. Not easy to dissolve as well.	It looked yellowish and was really easy to spread the mixture on the page	Brownish edges and it looked a bit like soy-sauce. The egg-yolk felt sticky. The smudge resistant was a bit high	On the other one it looked really dark brown. It smudged a bit lighter.
with cooking oil	When I mixed it and looked at it.  The ochre separated from the oil the oil went on top.	The ochre went on the page but the oil spreaded out all over the page: 	The cooking oil did this: the ochre stayed in the circle, but the oil didn't it spreaded on the page! the oil was had the lowest ^{smudge} resistant	On test 2 it was the same observation except the oil spreaded only a bit. Same here as well it had lots of smudges!

Analysis

1. a) What differences in the physical properties of the ochre mixtures did you observe?

I observed that some were watery, sticky and also gloopy, some looked rigid but they were actually smooth, some were really wet and smooth too. All things have

- b) Explain the reasons for the differences you observed.

different properties. The properties have been changed by the other materials/waters to get the gooey, watery sort of colour. Everything changes so these properties change too. It can

2. Use your observations to identify any relationships between types of mixtures.

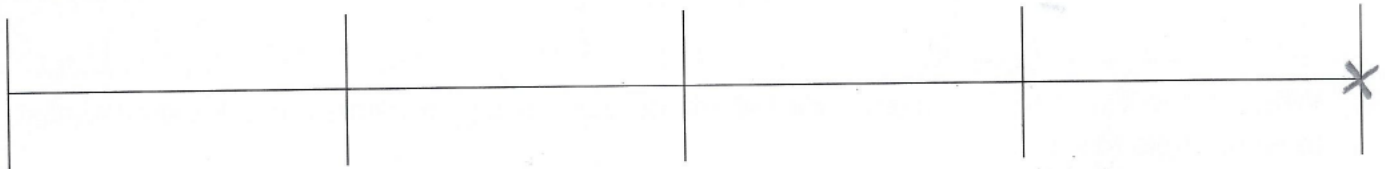
dry quickly or not. The oil and the water was the only one that looked the same. Once we put it on they started to change. Then they looked different.

3. Place a mark on the line to show how well you were able to answer the investigation question.

Not at all

Satisfactorily

Very well



4. Did your observations match your prediction? Yes/No Explain.

My observations matched my predictions because I now that glue can dry hard and not smudge. Even if mixed it with something it still dries smudge resistant.

5. Was the method you used fair? Yes/No Explain why or why not.

No, because I didn't put the right amount in each one but it still gave me the right prediction.

6. How could the investigation be improved to make it fairer?

It could be fairer if we put the same amount of mixture in the paper. This can make the predictions change. But we don't know that because it depends on the amount we put in.

Part B: Explaining ochre use

Read assessment task *Investigating properties affecting the use of ochre: Student resource 4 (Uses of ochre)* and answer the following questions.

7. Which of the four mixtures investigated would be the best for body painting?

Ochre and water is the best for body painting

Explain why using your investigation observations and science understanding.

I chose water and ochre because it is good for smudging and when there is a lot of ochre mixed with water, it is not ridged it is gooey, good for spreading on the body.

8. Which of the four mixtures investigated would be best for a rock painting in a location similar to Nourlangie Rock?

Ochre and water would be best

Explain why using your investigation observations and science understanding.

Because, it depends if you put a amount of ochre. If you put less ochre in water it would look light. if you put a lot of ochre you'll get a lot of gooey ochre that's dark.

9. If modern-day paints are not available, which of the four mixtures investigated would be best to paint a mural?

Ochre and water is best to paint a mural

Explain why using your investigation observations and science understanding.

Because, it has enough ochre to be painted
and it is good for painting rocks. But it depends
if it is outside or inside a cave/school.

10. Which of the four mixtures investigated would be best to use on didjeridus?

Ochre and Pva glue is best

Explain why using your investigation observations and science understanding.

Because it can stick well to things
everlasting. Plus, if you mix it with colours,
it looks cool! But... It may have lumps
in it. But it depends. Everything depends.

11. Are any of the mixtures unsuitable for any of these painting scenarios?

Ochre and egg yolk are not suitable

Explain why using your investigation observations and science understanding.

Because: 1. some one may have allergies of egg.
2. It is too gloopy for murals and caves
3. The didjeridus might rot because of the mixtures