Trend Task: Cleaning Up

NEMP Access Task

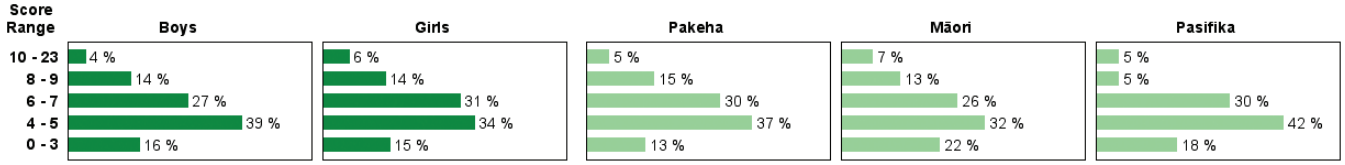
Approach:	One to one
Year:	4 & 8
Focus:	Explaining the reaction between water, oil and detergent
Resources:	Water in jug, 2 jars, bottle of cooking oil (liquid 1), bottle of detergent (liquid 2), 3 ice block sticks, 2 50ml beakers

Questions / instructions:

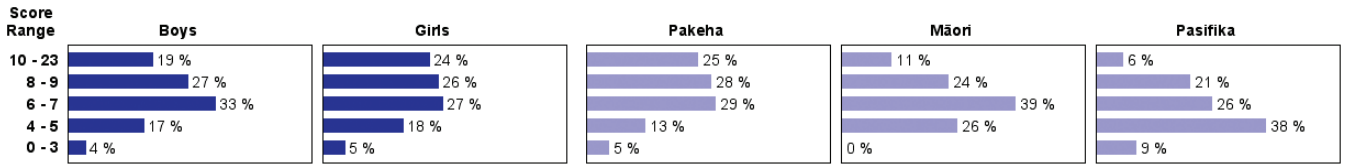
	% response 2007 ('03) year 4	year 8
Pour about 10ml of the oil into a beaker and about 10ml of the detergent into the other beaker. Fill the jars a third full with water.		
In this activity you will be doing an experiment with some different liquids.		
Hand out oil beaker, jar of water and ice block stick.		
By looking at this liquid and mixing it with the water see what you can find out about it. Pour the liquid into the water and stir it with the stick.		
Allow time		
1. What can you tell me about the liquid you put in the water? yellowish colour	31 (34)	11 (9)
fairly thick/viscous	14 (7)	23 (15)
floats on water/droplets, swirls on surface	43 (51)	72 (76)
forms droplets on/in water	27 (22)	23 (19)
2. What do you think the liquid is that you put in the water? oil or cooking oil	31 (26)	82 (77)
Here is another liquid.		
Hand out detergent beaker, jar of water and ice block stick.		
By looking at this liquid and mixing it with the water see what you can find out about it. Pour the liquid into the water and stir it with the stick.		
3. What can you tell me about the liquid you put into the water? yellowish colour	49 (35)	38 (22)
fairly thin *(not as thick as oil)*	5 (2)	7 (4)
noticeable smell	20 (25)	17 (23)
initially goes to bottom of water	15 (13)	18 (18)
mixes with the water	15 (21)	37 (54)
makes bubbles	62 (48)	78 (51)
4. What do you think this liquid is that you put into the water? detergent/soap	72 (55)	93 (86)
Point to jar with liquid 1 in it.		
The liquid you added to this jar of water is cooking oil.		
Point to jar with liquid 2 in it.		
The liquid you added to this jar of water is detergent.		
Now you are going to mix the cooking oil and the detergent together in the water.		
Hand out ice block stick.		
Tip the jar with the water and detergent into the other jar that has water and oil in it. Give it a stir.		
5. Tell me what happened when you stirred it.		
6. Why do you think this has happened?		
Throw out ice block sticks after use.		
Oil droplets get smaller: *(because the detergent broke it up AND because of the stirring)*		
observation plus both explanations	0 (1)	1 (2)
observation plus breaking up explanation	1 (4)	15 (14)
observation plus stirring explanation	4 (3)	5 (5)
observation only given	16 (12)	24 (24)
any other response	79 (80)	55 (55)
Bubbles were made: *(because the detergent mixed with water)*		
observation explained	7 (8)	10 (9)
observation only given	71 (56)	68 (52)
any other response	22 (36)	22 (39)
It went cloudy: *(because of the smaller droplets of oil in water)*		
observation explained	1 (1)	2 (0)
observation only given	29 (31)	24 (30)
any other response	70 (68)	74 (70)
Overall quality of observation and explanation: very good	0 (0)	2 (4)
good	3 (6)	14 (11)
moderately good	27 (25)	39 (34)
poor	70 (69)	45 (51)
Total score: 10–23	5 (5)	22 (25)
8–9	14 (10)	26 (15)
6–7	29 (24)	30 (28)
4–5	37 (38)	17 (19)
0–3	15 (23)	5 (13)

Subgroup Analyses:

Year 4



Year 8



Commentary:

This task, which involved observation, experimentation and interpretation was performed much better, on average, by year 8 students than year 4 students. Year 4 students tended to focus more on superficial attributes like colour rather than the most informative attributes. Year 4 Māori and Pasifika students performed quite similarly to year 4 Pakeha students.