Task: Te Taumaha — Water Weights

Approach: One to one
Focus: Buoyancy displacement
Resources: Video recording on laptop computer, mug of water, weight, spring balance
Kupu: maihea = weight ine-taumaha = spring balance āwhata = scale (for measuring)

VIDEO SCRIPT:

Kei te hōpua kaukau a Aroha me tōna tūngane. Ka ngana ia ki te hiki i a Jess, ki te whiu ki roto i te hōpua kaukau. Auē, he taumaha rawa a Jess. Nō muri kē, i a rāua i roto i te wai, ka ngana anō ia ki te hiki i a Jess. Ināianei he māmā noa iho ki te hiki. Pai ana te hiki a Aroha i tōna tūngane ki runga rā anō.

Alisa is at the swimming pool with her big brother. She tries to lift Jess up to throw him into the pool. She finds that Jess is too heavy. Later in the water she tries to lift Jess again. This time it is easy to lift him. He feels much lighter in the water. Alisa can easily lift her brother up high.

Questions / instructions:

He mahi rorohiko tēnei.

Ka mātakitaki tāua i te whiti ataata. Ka kite koe i ētahi tamariki i te hopua kaukau.

Pāwhiria te pātene *Te Taumaha*, ka timata te whiti ataata.

I kite koe i a Aroha e hiki ana i tōna tungāne. Kāore e taea e ia tōna tungāne te hiki i te taha o te hopua kaukau. Engari he māmā noa iho te hiki i a ia i roto i te wai.

This activity uses the computer.

Let's start this activity with a video. The video shows some children at the pool.

Click the *Water Weights* button. The video will start.

The video showed Alisa trying to lift her brother. She couldn't lift him at the side of the pool. But when she got in the water she found it easy to lift him.

	% responses
1. He aha i māmā ake ai te hiki i te tungāne i roto i te wai? Why was it easier to lift her brother when they were in the water?	
buoyancy *(water displaced)* helps lift you up/float	40
makes you light, weigh less	33
body pushes water aside, producing upwards force on body	0

Ka mahi tāua i tētahi whakamātau. Ka whakatairite i te taumaha o tētahi mea i roto, i waho hoki i te wai.
Hoatu te maihea me te ine-taumaha ki te ākonga.

Now we're going to do an experiment. We're going to compare the weight of an object in the water and out of the water.
Give students the spring balance and the weight.

2. Inea te taumaha o te maihea, ka tuhi ai ki te pukapuka.
Tukuna te ākonga ki te ine i te taumaha o te maihea, ka tuhi ai ki roto i te pukapuka.
Weigh this object and then we'll record its weight in the recording book.
Let student weigh object and record weight on recording sheet.
3. Ki te kuhuna te maihea ki roto i te wai, ā, ka ine anō koe i te taumaha, ki tōu whakaaro, he ōrite te taumaha, he taumaha ake, he māmā ake rānei?
If you weigh the same object again, but this time in water, do you think it will weigh more, less or the same?

	% responses
Prediction: weigh less	78

Inea te maihea kia kitea ai mēnā kei te tika tō whakautu. Kuhuna te maihea ki roto i te wai, engari kia kaua e pā atu ki te papa raro.
Tukuna te ākonga ki te ine i te taumaha o te maihea i roto i te wai.

Let's weigh it and find out. Make sure the object is covered by the water but not touching the bottom.
Let the student weigh the object in the water.

4. Tirohia te āwhata, ka tuhi ai i te taumaha ki te pukapuka. Tuhia te taumaha.
Look at the scale, then we will record its weight in the recording book. **Record weight.**
5. He ōrite te taumaha, he taumaha ake, he māmā ake rānei te maihea i roto i te wai?
Does the object weigh more, less or the same in the water? not marked •
6. Whakamāramahia mai he aha i rerekē ai te taumaha o te maihea ina kuhuna ki te wai.
Try to explain why the weight changed when the object was in the water.

		% responses
water helps support/lift/hold the object's weight		38
object pushes water aside, producing upwards force on body		3
Total score:	4–5	1
	3	21
	2	27
	1	30
	0	21

Commentary:

About half of the students succeeded with two or more of the three marked components.