Home Learning TV: Junior Science


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| **Segment lesson planning details** |  |
| Title for segment: | The Science of Kai  |
| Year levels *(e.g. Yrs1 – 3)*: | 1-3 |
| NZC learning areas:  | Nature of Science: Investigating in science - extending experiences and explanationsScience: Material world - Observe, describe and compare physical and chemical properties of common materials |
| Purpose of lesson:(What learners will learn) | Exploring states of matter using common materialsExploring characteristics of liquids (Newtonian and non-Newtonian)Gathering data through visual observations, with suggestions for hands-on experiences  |
| Success Criteria – students will be able to:(how they will know when they have learnt it) | Ākonga will be able to:* identify some of the characteristics of solids and liquids
* begin to discuss that we can see the evidence of gases in our food, e.g., holes in bread
* recognise that the people who make our meals and look after us are inspiring and innovative
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| **Segment production details** |
| Equipment requirements: | Foods and drinks are featured in the supplied PPT photos - actual food and drink to manipulate during the episode (optional - but handy) includes Vegemite sandwich, bowl of yoghurt, apple slices, glass of ice water, cup with water and a slice of lemon - or similar, plate and spoon, towel, jars of various sizes, jug of water, small platerunny honey / syrup and bread (optional)whiteboard and feltsPPT |
| Copyright requirements:Please be specific: Source: (*Seven Sizzling Sausages* by Sam Smith –url link to the source), intended use (to demonstrate alliteration), Length (timings for video clips) | All images and video provided in the media zip folder below have been cleared for use |
| **Segment links and attachments *(list all links to recordings or attachments, the source and confirm that copyright permissions are granted)*** |
| Links to recordings /resources |  |
| Attachments  |  |
| **Segment plan content** |
|  | Teaching and learning activities linked to purpose | High level script (key points/questions)  |
| **Activate**: Activating prior learning, knowledge of contexts and relationships | Introduction, making connections and setting the scene.Those who care for us. and sometimes provide meals with not a lot in the cupboard, are inspirational and innovative people.Helping tamariki and whānau switch into science mode.Practising the science capability ‘gather and interpret data’.**SLIDE: Lunch**Filename: JS\_10\_Lunch.jpg | Kia ora, greetings [touch base with the audience.]Yesterday, when I was making my lunch, I thought of my grandmother. I loved going to her place when I was young because she always greeted me with a plate of food. The kai didn’t have to be special, often it was Vegemite sandwiches, like those I was making for lunch today. Granny made the sandwiches fun by cutting them into bite-sized shapes and arranging the pieces into a smiley face.How about you - who is the person in your whare or whānau - your 'āiga - who can make a tasty meal out of just a few of the things from the cupboard? If they are in the room with you, go and give them a hug or a high five. Let them know how special they are or what you really like about their cooking.While you were doing that, I was taking a closer look at the kai I’ve prepared. Have a look. Not only does it make me hungry, but looking at it reminds me of science. Wow - there’s science in EVERYTHING!Okay kaipūtaiao/scientists, we have to warm up our [wairoro](https://maoridictionary.co.nz/search?idiom=&phrase=&proverb=&loan=&histLoanWords=&keywords=brain) - our science brains - so that we are thinking and investigating like scientists!Here’s a photo of my kai. [Show image.] What do you observe? Remember, our observations are what we can see, hear, smell, touch or taste - saying it looks yummy isn’t a scientific observation, that's an opinion. What do you see? Āe - we observed:* bread, cut into tapatoru-triangles (my Vegemite sandwich)
* a glass dish with something pink inside (strawberry yoghurt)
* 4 slices of a red skinned āporo-apple
* a glass with ice and a clear liquid - wai/water - keeps me healthy
* a cup with liquid and what looks like a slice of lemon (hot lemon and honey drink for after my lunch)
* a blue table cloth - a beautiful cloth that I bought at a market in Apia
* white plate and a spoon

Ka pai. We’re already thinking like kaipūtaiao - we’re observing carefully. The next thing we need to do is get out our special pukapuka and write the title of what we’ll be investigating. Remember how I said that science is everywhere? Let’s write ‘Science with kai’. [Please write and spell each word in your book or on a whiteboard.] If you can’t write anything down, just listen and watch along with me!Kai is the Māori word for food. I’ll be using a bit of te reo Māori today. You might know other kupu Māori for some of the words I’m using - or how to say the words in other languages!  |
| **Learn**: Introducing learningReinforce routines, provide multiple exposure to concepts, and strategies. Scaffolding learning  | NOS - science knowledge is derived from direct observations.Recognition of prior knowledge.**SLIDE: Text**Senses* sight - āta tirotiro
* smell - rongo kakara
* taste - rongo tāwara
* hearing - whakarongo
* touch - rongo whakapā

Hygiene advice for the pandemic.Grouping everyday items - things you eat, things you drinkExploring and describing the characteristics of solids.**SLIDE: Text** solid - totoka Repeating, reinforcing knowledge of the characteristics of solids. **SLIDE: Apple pieces** Filename: JS\_10\_ApplePieces.jpg**SLIDE: Sandwich pieces** Filename: JS\_10\_SandwichPieces.jpgCreating a visual representation. | Let’s investigate my lunch a little more carefully. Scientists use all of their senses to observe. Remind me what our five senses are. Ah yes, they are:* sight - āta tirotiro
* smell - rongo kakara
* taste - rongo tāwara
* hearing - whakarongo
* touch - rongo whakapā

We’ve already used sight to observe what’s for lunch. There’s a screen between you and me, so you can’t smell the kai.Because I can’t share my kai with you, it's not fair if I use my sense of taste. I will save that until later, when I eat my lunch.Does kai make a sound? Sometimes it does when it is cooking, but this kai doesn’t make any noise, does it? So, observing by listening is out.So that leaves me with touch. I can touch the food, if I’ve washed my hands - horoi ō ringaringa. I’ve got some hand sanitiser on the table. I’ll use some now. Ordinarily, I’d use soap and water, but I don’t want to leave you alone. [Clean your hands and mention how important it is, when washing your hands, to sing the happy birthday song whilst doing so.]I’ve got clean hands now. What should I pick up first?What did you say? You want me to touch the pink stuff? I’ve got a feeling that will get messy.Hmm [waving hand around the hot cup] - and this feels a bit warm to touch directly.Perhaps instead of sticking my fingers in my lunch I need to find a different way to think and observe. Some of my lunch is for eating and some is for drinking. Help me with this:Eating* sandwich
* apple
* yoghurt

Drinking* water
* lemon and honey drink

Now, if I think carefully about the eating part of my lunch, the sandwich and apple are quite firm and I can easily pick them up with my clean hands to take a bite. Scientists have a special word for things that are firm. Do you know the word? Āe - it’s [totoka](https://maoridictionary.co.nz/search?idiom=&phrase=&proverb=&loan=&histLoanWords=&keywords=totoka) - solid. A solid is something that can keep its own shape. Let’s think about what that means - keep its own shape. My spoon keeps its own shape - it stays the shape it is if I pick it up, put it down on the table or even bump it against my plate. [Demonstrate each action.] My spoon is a solid. The plate that I bumped my spoon against is a solid too.What about my apple? Does it keep its shape if I pick it up or move it around? [Demonstrate.] It stays the same. What about if I poke it? It stays the same. My apple is a solid.What about my sandwich? If I move my sandwich to another part of my plate, does it keep its own shape? Āe. What happens if I pick it up? [Do this with one of the points, so it doesn’t sag too much.] It’s kind of floppy, but it’s still the same triangle I started with. My sandwich is a solid, too. It turns out I can use my sense of touch after all. All of these solids feel firm when I touch them. I can hold the spoon and the apple and even the sandwich in my hand and they stay put.You know another cool thing about solids? We can cut them into smaller pieces. So, if I chop a bit off my apple slice, I now have 2 pieces. And I can keep making smaller and smaller pieces. Those pieces are still solids. We said that my plate is a solid. If I dropped my plate and it broke into pieces would they be solids? Yep, they would.And my sandwich? Yep, I saved the best for last. I can keep cutting my sandwich into smaller and smaller pieces until I’m left with breadcrumbs that I need a magnifying glass to see. They are really, really tiny, but they are still solids!Let’s record our ideas in our pukapuka. [Model what the tamariki will draw.] Let’s draw a [porotaka](https://maoridictionary.co.nz/search?idiom=&phrase=&proverb=&loan=&histLoanWords=&keywords=circle)-circle to represent my plate. I’ll draw a tapatoru-triangle on the plate to represent my sandwich. I’m going to put a few dots around it to represent breadcrumbs. Next, I will draw a niko- crescent on the plate to represent an apple slice. You big kids can write labels, too. Let’s label this: totoka - solid. |
| **Respond**: Providing opportunities to use and practice  | Exploring and describing the characteristics of liquids.**SLIDE: Ice water and condensation** Filename: JS\_10\_IceWater.jpg**SLIDE: Text**liquid - wēProviding an opportunity for hands-on experience.**SLIDE: Text*** jars or cups
* jug of water
* towel

Creating a space for tamariki to gather materials for the investigation.Repeating, reinforcing knowledge of the characteristics of liquids.**SLIDE: Hot drink**Filename: JS\_10\_HotDrink.jpg**SLIDE: Lunch Repeat**Filename: JS\_10\_Lunch.jpgA very brief introduction to Newtonian and non Newtonian fluids.**SLIDE: Liquid honey**Filename: JS\_10\_LiquidHoney.jpgRecognition of prior knowledge. **SLIDE: Text**solid - totoka liquid - wēgas - haurehu We look for evidence of gases because gases are invisible. Providing a couple of examples of where we can find this evidence.**SLIDE: boiling kettle letting out steam**Filename: JS\_10\_BoilingJug.jpg**SLIDE: Extreme close up of bread**Filename: JS\_10\_ExtremeCU\_bread.jpg**SLIDE: Bread dough**Filename: JS\_10\_BreadDough.jpgRecording visual representations in the journal.**SLIDE: Text** liquid - wē gas - haurehu  | Okay experts - let’s get back to our observations. The solids - like the apple and the spoon - were pretty easy to identify. The sandwich was a bit more tricky because the bread is soft, but it is still a solid.Let’s observe my glass of water. Am I able to pick up the glass? Yes - the glass is a solid. Let’s observe what is inside of my glass. I see some ice cubes and some water. Are there any solids in the glass? Any things in there that I can pick up? I can put my fingers in the glass. I’ll try not to make a mess. I can pick up the ice cubes. [Demonstrate.] They are firm and at least for a little while, they hold their shape, don’t they. So, we say that ice is a . . . what do you think? Yes, it’s a solid. Ka pai! Can I pick up the water? [Demonstrate trying to take a pinch of water.] No. I can’t. How about if I poke it? Does it keep its shape? No, it moves as my finger moves. Is the water in my glass a solid? No, it isn’t - but I bet you know what it’s called. It’s wē - liquid. A liquid is something that we can pour. After we’ve finished our time together, I’m going to pour the water from my glass into the sink. I’ve had my fingers in it, so I don’t think I should drink it!There’s something really cool about liquids. They take on the shape of the container that we pour them into. That’s a tricky thing to think about, but it makes a lot of sense if we can demonstrate it. I'll tell you what. I’m going to get some jars and a jug of water. I’m also going to get a towel - just in case there are drips. Maybe you can get these things too. You will need:* some empty jars or cups of different sizes or shapes
* a small jug or bottle of water
* a towel to catch any spills.

If you don’t have these things handy, that’s okay. You can do this later while you are outside or even when you are in the bath![Pause while tamariki find their things, fill the space by reorganising your work area and laying out some jars of different sizes/volumes, a jug of water and a shallow plate. Then, spend some time pouring water from the jug into a jar, from jar to jar, etc.][Invite tamariki to join you, pouring water into different containers.Discuss what is happening with the water and how it takes on the shape of the container. You may also wish to mention how the water level differs when you pour from jar to jar, due to the shape and size of the jar, but keep it simple. Finish by pouring some water onto the plate - noting that the water takes on the shape of the plate. Compare this to spilling water - how it takes on the shape of the kitchen bench or the floor.]That was fun. I really enjoy investigations and figuring out how things work.I have a hot drink, too. Let’s think about that. Am I able to pick up the cup? Yes - because it is a … solid. I’m not going to put my fingers in the cup because it’s hot and that would be a silly thing to do. Let’s do this part in our heads. Would I be able to pick up the lemon slice? Yes, because it is a …. solid. Right again. What about the watery stuff inside - would I be able to pick it up in my fingers? No because it is a ….liquid. Would I be able to pour the drink out? Yes I can. If I pour my hot drink into a jar will it take the shape of the jar? Yes it will. But, that’s not something I want to investigate or demonstrate, because it’s not safe. And, I want to drink my hot lemon and honey drink, not waste it!There’s one thing left from my lunch that we’ve not talked about. And that’s what’s in the bowl - it’s strawberry yoghurt. What do you think - is yoghurt a solid or a liquid? If you think it’s a solid, e tu - stand up straight and tall and pretend that you are a solid. [Please demonstrate.] If you think the yoghurt is a liquid, stand up, but ooze to the floor. [Please demonstrate.] So, what is the yoghurt - a solid [demonstrate] or a liquid [demonstrate]?Those of you who oozed to the floor are right. Yoghurt is a liquid, but it’s what some people call a ‘strange liquid’ because it doesn’t act like water or juice. We can pour yoghurt out of the container and it takes on the shape of the bowl that we pour it into, but it flows really slowly. What other strange liquids can you think of? Ones that we can pour, but are quite thick.[Show image.]Do you recognise this? It’s honey slowly flowing from a spoon. When the honey lands on the slice of bread underneath it, it will slowly spread out to take the flat shape of the bread.[You could model this part with a bottle of syrup / some runny honey instead.]Some of you older tamariki - and your whānau - might know what we are going to talk about next. Because you know that we can’t talk about solids and liquids without talking about … [put your hand to your ear to mimic what the viewers are now shouting out]. Exactly! We are going to talk about [haurehu](https://maoridictionary.co.nz/search?idiom=&phrase=&proverb=&loan=&histLoanWords=&keywords=haurehu) - gases.Most gases are invisible. We know that air is all around us and it is made of gases. We can’t see invisible gas, but we can see evidence of where it’s been. I used a jug to boil water for my hot drink. When you watch water boil, some of the water turns into a gas. That gas is in the bubbles. We call it steam. [Note to presenter - the scientific definitions are more specific than the ones in everyday language - scientifically, steam / water vapour is invisible - the ‘steam’ we see from a kettle is actually where the water vapour (gas) has condensed into tiny droplets of water – specific language is therefore important, so as to not inadvertently reinforce ideas that may become resistant to change.] Another place you can see evidence of a gas is in my sandwich. [Show image - close up of bread].If you look really closely at the bread, you can see holes. We often use yeast when making bread dough. [Show image - bread dough]The yeast makes gases, which makes the dough rise. These holes are formed in the dough because the gases produced by the yeasts are trapped - they form bubbles of air. We need to record these ideas in our pukapuka. I’m going to make a label that says ‘liquid - wē’ - and draw some drops of water forming a puddle, because, oops - I spilled my drink! [please demonstrate.]Now I will write ‘gas - haurehu’. I’m going to draw a tapatoru - triangle for my slice of bread, and put in a few circles for holes - for where the gases are. I’m also going to draw a kettle and show the bubbles that form when the water boils. [Note to presenter re. Earlier background around steam – this is why it's important that you focus on the bubbles, rather than the water vapour (commonly called ‘steam’) that we see from the spout.] |
| **Share**: Learner and parent reflection on learning and engagement and what they can do next | Reminder of key ideas/content vocabulary that have been introduced.**SLIDE: Bread and milk**Filename: JS\_10\_BreadAndMilk.jpgProviding an opportunity to continue with the topic of solids, liquids and gases - the science of kai.Providing an opportunity to make observations and comparisons. | Who knew that my lunch was going to be such an amazing learning experience! But like I said earlier - pūtaiao is everywhere!When you have lunch, think like a kaipūtaiao and see what part of your kai is a solid. That’s food that holds its shape - like a piece of fruit or cheese or a cracker.Think about what part of your lunch is a liquid, wē - something that, when you pour it out, it takes the shape of the glass or bowl. If you put tomato sauce on your kai, it’s one of those strange liquids - like yoghurt.Don’t forget to look for the invisible - is there evidence of gas in your kai? Maybe bubbles in your milk when it is first poured? Holes in your bread? [Show image - bread and milk]Perhaps you can do some baking with your whānau. Mixing flour, eggs and milk together to make muffins, and having something yummy to share at the end, is a great way to observe what we’ve talked about today. Think about making takakau - a bread made without yeast, so it doesn’t rise. Compare a slice of takakau with a slice of bread from the shop. Make some observations, find some honey, and then dig in.I hope you’ve enjoyed spending this time with me. I look forward to seeing you next time!Mā te wā, see you again.  |