**Home Learning TV: Junior Science - 10 September**

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| **Segment lesson planning details** |  |
| Title for segment: | Mata o te Marama - Phases of the Moon |
| Year levels *(e.g. Yrs1 – 3)*: | 1 - 3 |
| NZC learning areas:  | Planet Earth and beyond - astronomical systems - observation of the MoonNature of science - investigating in science through exploration and use of simple modelsScience capabilities - gather and interpret data, interpret representations |
| Purpose of lesson:(What learners will learn) | Learning to:* Observe and notice changes
* say why the changes happen

Knowledge:* The Moon is part of the night sky
* Although the Moon appears to change, it is always the same shape
* What does change is how much of the Moon we see from Earth, due to light and shadow
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| Success Criteria – students will be able to:(how they will know when they have learnt it) | Remember to:* give reasons

Will be able to:* begin to discuss that the Moon is a sphere and its shape does not change
* begin to discuss that the appearance of the Moon’s shape changes due to light and shadow
* begin to associate the phases of the Moon with maramataka
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| **Segment content/context details *(as appropriate)*** |
| Māori specific content i.e. the learning draws on Mātauranga Māori: | Maramataka is a component of Mātauranga Māori. | Pacific specific content i.e. the learning is focused on Pacific knowledge: | Pacific people have developed their own local mātauranga. It is used in lunar calendars similar to maramataka. |
| **Segment production details** |
| Equipment requirements: | Suzy’s home studio |
| Copyright requirements:Please be specific: Source (*Seven Sizzling Sausages* by Sam Smith –URL link to the source), intended use (to demonstrate alliteration), and length (timings for video clips) |  |
| **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) [Please use <https://maoridictionary.co.nz/> for pronunciation support] |
| **Activate**: Activating prior learning, knowledge of contexts and relationships | Connecting with the audience and making connections between the Matariki episodes.Using observation to build an understanding of complex concepts and language. Links to Pasifika systemsProviding a visual representation of maramataka and lunar cyclesScience capability - interpret representationsIntroducing content vocabulary*each of the aspects of the moon or a planet, according to the amount of its* ***illumination****, especially the new moon, the first quarter, the full moon, and the last quarter*. | [Greetings in multiple languages][Share any texts or emails you’ve received]It’s good to see you again. What have you been doing-behaving like scientists and observing the night sky? Did you go out and look for any kōkiri - meteors? We learned in our last episode that they’re the bits of space rock or dust that come close to Earth and then streak across the sky as they burn up. You need a pretty dark sky to see those, though. Those of you who live on farms may have had a better chance of seeing kōkiri than those of us who live in towns and cities. Do you remember why? Light pollution - it can limit the views we get of te Whānau Marama - the night sky. Today, we’re going to continue being scientists and learn about one of the most obvious night sky objects, one that you all would have seen many times. Can you guess what I am talking about? No?Here are a couple of riddles. If someone is watching with you, perhaps you can solve them together.* I’m sometimes full, but I’m never empty.

So we’re talking about the night sky - not our tummies! What can you see in the night sky that is full? Not sure? Here’s another riddle.* I grow, then I shrink and then I grow again.

What’s your guess? If you think it is te Marama - the Moon - then you answered the riddles! If you're still not sure how we figured this out, let’s use these images to help us ‘see’ the answers.* I’m sometimes full, but I’m never empty.

[Discuss the roundness/completeness of the Moon]**File name: 38486538\_l.jpg**[https://www.123rf.com/stock-photo/moon.html?start=110&sti=misrmsijy6u0dsjfjq|&mediapopup=38486538](https://www.123rf.com/stock-photo/moon.html?start=110&sti=misrmsijy6u0dsjfjq%7C&mediapopup=38486538)Have a look at this image and think about the riddle.* I grow, then I shrink and then I grow again.

[Discuss the image and how the Moon appears to change shape.]**File name: 88789067\_l.jpg**[https://www.123rf.com/stock-photo/moon.html?start=110&sti=misrmsijy6u0dsjfjq|&mediapopup=88789067](https://www.123rf.com/stock-photo/moon.html?start=110&sti=misrmsijy6u0dsjfjq%7C&mediapopup=88789067)Looking at the photos and thinking about the riddles reminds me of something we talked about in an earlier episode: maramataka - the Māori lunar calendar. Do you remember? A lunar calendar is based on te Marama, the moon. For centuries, Māori and Pacific people have used the lunar calendar to signal things like planting, hunting or fishing during the different seasons of the year.We looked at this picture of a Samoan lunar calendar - lots of Island cultures have calendars based on the nights of the Moon.On the left side of the picture, we can see Sina and the tuna - the eel - that fell in love with her. On the right side, we can see the nights of the calendar. Look how Māsina - the Moon - starts as a little sliver and grows until it gets round. Then it shrinks back into a little sliver before it disappears.**Filename: LunarCalendar\_EasternPacificRegionalFisheryManagementCouncil.jpeg** Hang on, this is a show about pūtaiao - science. I’m a bit worried that I might be using the wrong words for what is happening with the Moon. Does it really grow, or shrink and does it ever actually disappear? That doesn’t sound quite right, does it? I think we need to do some investigation.The first step is to open our science journals and write the title for today’s investigation: Mata o te Marama - Phases of the Moon. ‘Phase’ is a scientific word describing how something looks. So when we talk about phases of the Moon, we are talking about what the Moon looks like when we view it from the Earth. |
| **Learn**: Introducing learningReinforce routines, provide multiple exposure to concepts, and strategies. Scaffolding learning  | Engaging questions and investigations suited to NZC levels 1-2. | Today we are learning to use our observations and our research to say why something is.Now we are ready to record our ideas and observations. Let’s watch!**File name: SW3 137 Moon Distribution.mp4**[**https://vimeo.com/421401300**](https://vimeo.com/421401300)<https://www.youtube.com/watch?time_continue=3&v=bdyHg4K87ME&feature=emb_logo> |
| **Respond**: Providing opportunities to use and practice  | Scientists use models to explain things that we are not able to experience first-hand.Checking the model against photographic evidence.Presenter suggests this to happen-perhaps after the programmeWorking through common alternative conceptions about the Moon.Scientists use specialist terms to ensure accurate communication.Reflecting and linking this episode with prior knowledge/prior episodes.Exploring scientific explanations alongside mātauranga Māori | It’s just as well we investigated! The Moon doesn’t shrink, does it?The ball I was using as a model of the Moon did not change shape at all. It stayed the same shape the whole time the ball and I were moving around or orbiting the Earth. What did change was how much of the ball was in the Sun’s light and how much was in the Earth’s shadow. If we look at this image, half the ball is in the shadow and half is in the light. Let’s compare it to an actual photo of the Moon in the night sky. They look about the same, don’t they?**FILENAME: JS\_10\_Moon phase combined.png**JS\_10 Moon phase screenshot and JS\_10 Hub Moon phaseRevisit journals and invite students to draw the changing phases of the moon with you modelling this. See <https://www.sciencelearn.org.nz/images/684-moon-phases> as a guide - please note that in Southern hemisphere, it’s the left hand side of the moon that gets lit first)**FILENAME: MoonPhasesFromSouthernHemisphere.jpg**<https://www.sciencelearn.org.nz/images/684-moon-phases>So, the Moon doesn’t grow or shrink - it stays the same shape. That’s one myth busted.Now to our second question - does the Moon disappear? In an earlier episode, we learned about shadows - ātārangi. You know how shadows look dark? When there is a new moon, the side of the Moon we see is in shadow. The shadow is dark and the night sky is dark, so it looks like the Moon disappears, but we know it doesn’t, don’t we? I’d show you a photo - but dark on dark - there’s not much to see. That’s the second myth busted.I’m going to have to find a new riddle now - one that uses the correct scientific words. What about this one -**I am something in the sky****That seems to shine at night****However, I’m not a star****I am Earth’s satellite**This riddle helps us to remember that the moon doesn’t have its own light - it only shines when the Sun’s light reaches it and reflects off its surface.The riddle also talks about the Moon being a satellite, because it orbits the earth - an orbit is a curved path around another object. The Moon orbits the Earth, and the Earth orbits the Sun.And here’s a Maori whakataukī:**Kua hua te marama****The moon is full**This whakataukī can be used to celebrate the completion of a project, or to talk about how some things happen as cycles. Observing the moon helps us to feel connected with our world. As we said earlier, many cultures have also developed lunar calendars that help them to plan activities like planting, fishing and hunting. Let’s think about how mata o te Marama fits into maramataka - the lunar calendar. The nights of the new moon - Whiro and Tirea - are much darker than other nights, with only the stars lighting the night sky. These nights are good for catching tuna, or eels. I’ve heard that tuna - eels - don’t like the light, so they sneak out when it’s really dark.On the other hand, Oturu - the full moon - is a good time for planting food. I’ve heard the full moon draws water up through the soil - and we know plants need water for their roots.So when we are being scientists and observing and researching to explain we need to Remember To:give reasons or say why something isLet’s think about what we’ve learned today.* The moon doesn’t produce it’s only light, the bits we see are the bits that are lit up by the sun, the moon orbits the sun and so different parts can be in sunlight or shadow –
* phases of the moon are when we see different parts of the moon

So, did we give reasons for our new thinking? YES WE DID! Tino pai rawa atu! |
| **Share**: Learner and parent reflection on learning and engagement and what they can do next | Summarising the learningInviting students to continue learning by observing the phases of the Moon for themselves, using a systematic approach to create a Moon chart.Providing an opportunity to connect with whānau regarding maramataka and/or other cultural practices | If you’re wanting to find out more, why don’t you start a moon chart? [Demonstrate folding an A4 sheet of paper into 8 sections.] Every three days, go outside and observe the Moon and draw its shape on your Moon chart. You can see how its shape appears to change - even though you know that the entire Moon is still there - just some of it is in shadow.You could also ask whānau, or do some research, about which activities tend to be better done at different phases of the moon. You could add this information into your Moon chart, too![Sign off] |