

# Play School

## Notes for Educators and Families

### Series 345: Sea and Space

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#### Background

*Kiya and Jemima set off from the Play School Exploration Centre to discover the infinite wonder of what's way up above and deep down below, in this fascinating series 'Sea and Space'! Join Rachael, Alex, Emma, Matt, Zindzi and Kaeng - with special guests Garry Purchase and Dr Karl. Share in some brain-building experiments, look for life on Mars, and learn about the brilliance of bioluminescent sea creatures!*

*This ambitious series aims to extend children's engagement in STEM and inquiry-based learning. Inspiring wonder and delight in our planet and the solar system.*

#### About our special guests

##### Garry Purchase

Garry Purchase is a proud Aboriginal man of Dharawal, Bidjigal and Dhungutti descent. He grew up in Sydney's Eastern suburbs in Botany and was raised amongst the Aboriginal community of La Perouse. Garry is an artist and an experienced musician. In 2014, his painting "The Journey" won both the Aboriginal Health award and the People's Choice award at Mental Health Art Works! In 2016 Garry won the Aboriginal Health award "Missing Pieces" and in 2017 with his piece "Tribal Blood".

##### Dr Karl Kruszelnicki

[Karl Kruszelnicki](#) fondly known as "Dr Karl", is an Australian science communicator and popularizer, an author and an inspiring science commentator on Australian radio and television. Dr Karl is the Julius Sumner Miller Fellow in the Science Foundation for Physics at the School of Physics, University of Sydney - here his 'mission' is to spread the good word about science and its benefits. His enthusiasm for science is totally infectious and no one is better able to convey the excitement and wonder of it all than Dr Karl Kruszelnicki. In this series, Dr Karl guides us through some fascinating science experiments - great ideas to try at home or in early learning settings.



*Our Sea and Space adventurers Kiya and Jemima, with Alex and Rachael in the Play School Exploration Centre!*

#### Welcome to the Exploration Centre!

With DIY telescopes, gadgets, gizmos, images and artworks! The Sea and Space Exploration Centre inspires the big ideas and questions included in this series. Try setting up a similar area in your early learning setting!

#### Considerations for educators

- Build the 'bones' of the area to spark children's interest, then invite children add to it over time with things they make and find.
- Ask parents or local businesses to donate suitable loose parts to help furnish and decorate – boxes, containers, discarded pots and pans, metallic bits and pieces (watch out for sharp edges), old computer keyboards etc.
- Include a fresh selection of reference books. Consider a walk to your local library and borrow books about each environment. You could also ask families to share books from home for the duration of your project.
- Include pretend tech and supervised real devices. To promote imaginative play, encourage children to equip the area with their own "technology", made with upcycled loose parts (create pretend remote controls, walkie talkies, microscopes, computers etc).
- **Bright idea!** Do you have an interactive whiteboard in your classroom? Try setting up your Exploration Centre around the board to facilitate spontaneous online investigation. To create an immersive backdrop, you could change the board's screen saver each morning to reflect a different aspect of sea or space.
- Teaching and learning opportunities emerging from this series relate to **EYLF Outcome 2: Children are connected with and contribute to their world** and **Outcome 4: Children are confident and involved learners**.

## Episode 1

Kiya and Jemima fly the Explorer Mobile to the moon! Dr Karl and Rachael have fun testing the Bottle Diver experiment. Through the Windows we explore a colourful coral reef.

### Follow up ideas:

#### Make your own Balloon Astronaut

Alex makes a light and bouncy astronaut and sings 'Floating All Around' (to learn the words, watch again at 08:23mins).

Children can have fun bouncing their own Balloon Astronaut all around! For an additional music and movement experience, sing 'Floating All Around' together and invite children to move their bodies in slow and floaty ways. For added atmosphere, play ABC Kids listen's 'Stars' from the program 'Sleep Through'. Listen afterwards to ABC Kids listen's 'Imagine This' episodes:

- [Why do stars twinkle?](#)
- [Does space go on forever?](#)
- [Is there life in other galaxies?](#)



Dr Karl and Rachael share another interesting activity ... but this time they focus on floating and sinking under the water!

#### Exploring water pressure and buoyancy with the Bottle Diver experiment! You will need:

- A large, clear plastic bottle with a lid.
- A thin aluminium or stainless-steel sheet. This can be found at most large hardware stores.
- Scissors, a bendable straw and a paperclip.

#### Experiment procedure

1. Fill the water bottle with water.
2. Cut a figure from the metallic sheet. Make sure it can fit easily through the bottle opening.



3. To make the 'air tank', cut a bendy piece of straw and firmly attach it to the metallic diver.
4. Drop your little diver into the water, screw on the lid, then watch it drift down part of way down.
5. Squeeze the bottle to create water pressure. As you do this the diver will sink. As you gently release, the water pressure will reduce, and the diver will drift back up to the top!

Tip – You could use a liquid dropper as the diver. Suction water into the dropper so it is about 1/4 full. Place the dropper into the bottle and follow steps 4 and 5 to achieve the same result.

#### More fascinating facts about deep sea exploration

Rachael and Dr Karl mention some of the equipment needed to explore the deep, dark sea. Brainstorm other equipment ideas together with children, then investigate by visiting sites such as [Kiddle](#), for scuba diving facts and [Kids Britannica](#), for more child friendly info about underwater diving.

Children may be fascinated to learn about the [Deepsea Challenger](#), a special submarine that travelled down the [Mariana Trench](#) in the Pacific Ocean. The Mariana Trench is the deepest part of all the world's oceans! It is almost 11,000m deep (deeper than Mt Everest is high). Display photos or drawings of the Deepsea Challenger in your Exploration Centre (simply type "Deepsea Challenger" into an online image search). *Fun fact: the famous Deepsea Challenger is Australian made. It was built in the Sydney suburb of Leichhardt!*

#### The storybook read in this episode ...

'*Brother Moon*' (2020) by Maree McCarthy Yoelu and illustrated by Samantha Fry; focuses on a story passed down through generations, its messages reinforcing connection to Country,

For more resources on the importance of connection to Country in Aboriginal and Torres Strait Islander culture, watch Play School Special: [Acknowledgment of Country](#). Check out the [Notes for Educators](#) and families on the ABC Kids Early Education site.



## Episode 2

*Kaeng and Rachael explore the ocean's Midnight Zone, experimenting with light and glow in the dark paint! They meet artist Garry Purchase to talk about his painting and share Aboriginal stories. Through The Windows, we gaze up at the night sky!*

### Follow up ideas

The layered underwater diorama seen with Rachael and Kaeng could be great inspiration for a similar project in homes and classrooms. Just stack boxes, tape, paint, then add crafty creatures that can be found living in each layer.

- **The Sunlight Zone** is the warmest and lightest layer where most ocean life, plants and coral can be found.
- **The Twilight Zone** receives only faint sunlight and is home to some less familiar ocean creatures including bioluminescent sea life.
- **The Midnight Zone** is completely dark. Bioluminescent creatures can be found here too – some are VERY weird and wonderful!



*Turn your room into a gorgeous glowing underwater scene with this crafty jellyfish project.*

There are layers even deeper than the Midnight Zone! For more information, check out [LittleLives](#), [National Geographic](#), and the Government of South Australia: Department for Environment and Water site – [GoodLiving](#).

## The Emu in the Sky

Our special guest presenter, Garry Purchase, displays his painting titled 'The Emu in the Sky'. He explains the significance of oral storytelling and artwork in Aboriginal culture.

Garry's painting features the beautiful Emu Constellation. According to Aboriginal Dreamtime stories, Emus are Creator Spirits that travel across the land and look after it. The Emu Constellation can be found in the southern skies; the dark cloud between the stars is the head and the neck, body and legs are formed from dust lanes stretching across the Milky Way. For more information and inspiration:

- Read more about Aboriginal astronomy in this article from [ABC News](#).
- Check out this ABC Behind the News ([BTN](#)) [Teacher Resource on Aboriginal Astronomy](#), to watch the video, visit the [BTN website](#).
- The Art Gallery of NSW is showing '[Under the Stars](#)' throughout 2020 – 2021. This free exhibition highlights shared understandings of the night sky from Indigenous and non-Indigenous artists.



Build on children's understandings about Aboriginal and Torres Strait Islander culture through storytelling and art with these sea and space themed storybook suggestions; 'At the Beach I See' (2017) by Kamsani Bin Salleh, 'Crabbing with Dad' (2016) by Paul Seden and 'Staircase to the Moon' (2011) by Bronwyn Houston. Providing a contemporary range of storybooks by Aboriginal and Torres Strait Islander authors and illustrators is one great way to embed Indigenous perspectives in your early learning program.



*Did children spot all three Humpback whales hidden in Garry's scene? Look carefully!*

## Episode 3

Emma and Alex decorate the Explorer Mobile launch pad before Kiya and Jemima go whale watching! Dr Karl explains how red crabs on Christmas Island cross the road safely. Through The Windows, we learn all about astronauts!

### Follow up ideas

#### Make some beautiful “Galaxy Playdough”

To learn how to make Play School’s cooked playdough, visit our [Recipe](#) page. Turn plain dough into a “galaxy” by making three or four batches. Colour each batch differently – 2 x black, 1 x blue and 1 x purple. Give children a larger portion of black and a little of the other two colours. Many children will enjoy the sensory experience of rolling the bright colours through the dark. Add some environmentally friendly sparkles by cutting up tiny pieces of shiny recycled wrapping paper (recycled Christmas wrapping would be perfect).

Alex sings an adapted version of ‘Zoom’ during this segment. To learn the words, watch again at 03:04 mins. Encourage children to think of new verses incorporating their ideas about travelling to space!



Emma and Alex take the “Eggsplorer Mobile” for a zoom across the starry galaxy!

The story in this episode is called ‘Starry Skies’ (2018) by Samantha Chagollan and Nila Aye. The beautiful illustrations share information about some of the most famous constellations in the night sky. To watch again, tune in at 05:15mins.

Parents could take children out on a clear night and video their reactions to seeing stars and searching for constellations. Share star-gazing home videos with your child’s educators – this may inspire follow-up in the classroom! Little space enthusiasts may be interested in checking out [ABC Science’s Beginner’s Guide to the Night Sky](#). This is a comprehensive resource with great facts for grown-up’s and awesome images for kids – particularly helpful if it is difficult to see some of the constellations when you go out.



#### The Christmas Island crab dilemma!

Dr Karl shows Emma and Alex a video of thousands of crabs that live on [Christmas Island](#). They hypothesise about how the crabs might move safely from the bush to the beach. Their final solution was to build a bridge over the road! Brainstorming possible engineering solutions to a problem is an enriching way to build children’s awareness of processes in STEM and inquiry-based learning - these include:

- setting a challenge
- encouraging active investigations
- making generalisations
- reflecting

Read more about the principles of inquiry-based learning in our [National STEM education resources toolkit](#). You can also [Spend a Minute on STEM](#) with Early Childhood Australia’s (ECA) Learning Hub.

#### Making crafty crabs

Create a collection of crabs at your place by using lids with pipe-cleaners taped on either side and some little pegs for claws! To bring your crabs to life, try using the stop-motion filming feature on your device – children could film their crabs scuttling over a homemade bridge.



Jemima and Kiya use the position of the sun and the stars to navigate in the Exploration Mobile. Emma and Alex then explain the symbolism of the Australian, Aboriginal and Torres Strait Islander flags – each reflects sky, land and/or sea in some way.



## Episode 4

Join Matt and Alex as they experiment with making craters, go on an eventful journey in a crafty submarine and tell an entertaining story - with an important message about ocean conservation! Through *The Windows* we discover some amazing sea life.

### Follow up ideas

#### Exploring cratered landscapes on the moon and on earth

Next time you bake a cake, try making craters in the ingredients like Matt and Alex. You could also press round shaped objects into playdough or clay.

Extend on the clay idea by suggesting children could place a sheet of paper over the imprints and rub with the side of an oil-pastel. Children can create interesting textured artworks using this method. Moonscapes can be displayed in your Exploration Centre!

While on their expedition to Mars, Kiya and Jemima discover ice on this mysterious planet. Learn more about the planets via the [NASA Kids Club](#). Investigate the [Sydney Observatory Moon Phase Calendar](#), then go outside before bed to check the current moon phase. Talking about the moon phases can have great links to early numeracy – thinking about whole objects, halves, quarters and segments etc.



#### Ice on Mars ... and ice on earth

On hot summer days, fill up an outdoor trough with water and throw in some ice cubes (large and small). This will be a wonderful sensory experience for children and an opportunity to explore icy aquatic habitats. To find out about the adaptations of arctic animals and what we can all do to help protect their habitats, visit the [World Wildlife Fund](#) (WWF).

Follow up with watery sea collage like Matt. Just mix water with Edicol dye, then freeze in ice cube trays. Matt created watery backgrounds, then painted rainbow fish with the vibrant icy paint cubes! Link to understandings about the layers of the ocean gained in Episode 2 by encouraging children to represent a specific zone in their art making.



Using frozen paint cubes adds an exciting sensory element to this experience – a great idea for hot days.



#### Learning about ocean conservation

In this episode's told story *'Is This Yours?'*, we build children's understandings about why it's important to dispose of rubbish properly. To watch a group of preschool children on an excursion by the sea, check out this *Through the Windows* film, ['Ocean'](#). The children talk about why it is important to take rubbish away with you – it could end up polluting the ocean and harming sea life.

Extend by reading these children's books about caring for our oceans: *'Louie and Snippy Save the Sea'* (2019) by Collette Dinnigan and Grant Cowan, *'Save the Ocean'* (2019) by Bethany Stahl and *'Duffy's Lucky Escape'* (2017) by Ellie Jackson, illustrated by Liz Oldmeadow.

## Episode 5

Zindzi and Rachael explore the deep blue sea as Kiya and Jemima discover an underwater volcano! Zindzi and Dr Karl make their own fun volcano experiment. Through the Windows we take a tour through the Solar System!

### Follow up ideas

#### Sea creature guess and match game

It's the final episode of the series and children will have built deeper understandings about sea life along the way. This game is an enjoyable way to consolidate children's learning while promoting their verbal communication, turn taking, and listening skills.

- First, choose a selection of familiar sea creature figurines e.g. whale, turtle, shark, octopus, seal and fish.
- Print matching pictures of each animal and cut them out. (making a set of cards). Fold each card so the image is hidden. Place the cards into a hat.
- Place the toy creatures in the middle of a circle of children. Place a dish of water beside the animals.
- Children take turns to pick a card from the hat, being careful not to reveal the animal.
- The child begins to describe their animal, without giving away its name. Start each statement with something repetitive to help give the game structure e.g. "I am a sea animal and I have ..."
- When a child from the circle thinks they know the answer, they place their hand on the top of their head like a shark fin.
- The first child to do this chooses the toy animal that matches the description. If they get it right, they can plop the animal into the dish of water. Keep going around the circle till all the animals are in the water!



The group time game detailed above is a fun way to extend on this dress-up segment with Zindzi and Rachael.



#### Underwater volcano experiment

Dr Karl shows Zindzi how to create an underwater volcano. Recreate by filling a small jar with hot coloured water, then place it into a larger jug of cold water. The hot water flows up and out of the small jar because it is hotter than the water surrounding it. Learn more about how real underwater volcanos work by visiting the safe visual search engine for kids, [Kiddle](#).



Kiya and Jemima on their final adventure down below the waves to check out an amazing Submarine Volcano!

#### Check out these Sea and Space related resources accessed via the ABC Kids Early Education website:

- Audio - [Noisy by Nature: Fluffing Elephant Seals](#)
- Audio - [Little Yarns: Whale in Noongar](#) and [Moon in Yugambeh](#). Additional notes for each of these episodes can be found in ABC Kids Early Education's Extension Ideas.
- Video - Learn more about life under with sea with the [Octonauts](#) on ABC iview and on the ABC Kids app.
- Video - The collection of 'Through the Windows' films for this series can be found in the [ABC Kids Early Education STEM](#) and [Sustainability and Nature](#) curriculum areas.

#### Credits

Series Producer - Bryson Hall

Executive Producer - Jan Stradling

Notes for Families and Educators - Laura Stone