TANGLED PLANET

EDUCATORS' GUIDE

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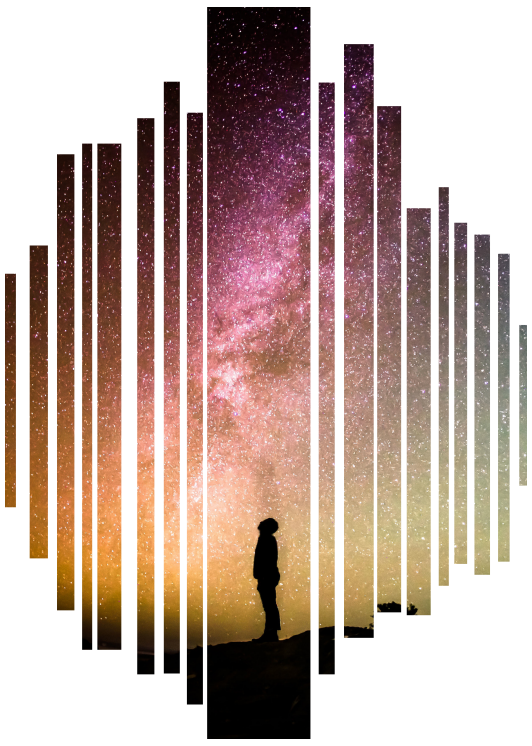

Tangled Planet

A group of humans has arrived at Beta Earth with plans to colonize the uninhabited planet.

But when Ursa, a seventeen-year-old engineer, finds a dead body - and swears she saw a large creature with sharp teeth leaving the scene - the community is divided.

Is the new world unsafe after all? Should they continue living on the starship *Venture* rather than settling on Beta Earth? Or is Ursa responsible for the death?

Science fiction becomes murder mystery as Ursa tries to clear her name and find out what is really happening on this strange planet.

Born on a tiny island stuck to the south of England, **Kate Blair** has worked as a museum curator, a clown and at a theme park on the Jersey Shore. She is now a young adult author and a speculative fiction geek living in Toronto. Kate's first novel, *Transferral,* was published in Canada in 2015, the US in 2016, and France in 2017. It was optioned for television and nominated for 2017 MYRCA, Snow Willow and Sunburst Awards. *Tangled Planet i*s her second Young Adult novel.

Generation Starships

***Tangled Planet* is about what happens when humans try to adjust to a new life on a distant planet, after living their whole lives on board a generation starship.**

A generation starship is a space ship that takes several generations to reach its destination. Crew will be born, raise children, live their whole lives and die on board.

Everything the crew needs to survive hundreds of years of travel must be provided on board, from food and fuel to air to gravity, as they have no opportunity to restock on the way.

Ursa and her crewmates have never known any home except the cramped corridors of the Venture, where they and their ancestors have lived for the last 400 years.

Why So Long?

Interstellar travel is far beyond our current technological abilities. The nearest star to our sun is 4.24 light years away. The fastest we've made a spaceship travel is 240,000 km/hr. At this speed, it would take 19,000 years to reach the nearest star - and we don't know if any of the planets in orbit around Proxima Centauri are inhabitable.

A journey time of 400 years to reach an inhabitable planet around a distant star would require a huge leap forward in technology.

Designing a Generation Starship

A generation starship would need to keep its population alive for hundreds of years on the way to its destination planet. How would you meet the needs of the crew on board?

For the third and fourth boxes, think of two needs yourself.

Need	Your Solution
Food	
Oxygen	

Genetic Engineering

Genetic engineering is when the genetic code (DNA) of a living organism is altered to change the living being itself.

Genetic engineering is used in a variety of industries - most commonly in agriculture - to take traits such as those that result in higher yields or resistance to insects, and add them to existing plants.

On Beta Earth, the plants on the planet have all been genetically engineered to make the settlement of the planet easier for the crew. For example, they have glowferns to help them see in the forest and trees that produce a polymer (similar to a plastic) that can be used in the settlers' 3D printers. The insects have been engineered not to bite humans, and the grain crops are adapted to the exact conditions and soil of the planet.

Science Fiction from Science Fact

Beta Earth has glowferns within its forests. These are ground-cover plants that emit light. They have been created by adding the bioluminescence traits of organisms such as jellyfish to a plant.

This is not entirely fictional. Scientists have added bioluminescence to animals. However, these animals only glow under UV lights. We have not yet managed to get a plant to emit useful visible light.

Engineer Your Own Lifeform

Think of a trait or characteristic of one animal or plant that could be useful if placed in another animal or plant. Explain why you think that trait would be helpful, and to whom.

Genetic engineering is controversial for a number of reasons. Activists have highlighted a range of dangers and moral issues around tinkering with the DNA of living things. Can you think of potential problems with this technology?

Characters

Ursa

Ursa is the main character in *Tangled Planet*. The story is told from her point of view. She is an engineer who is struggling to adjust to life on Beta after losing her best friend.

Describe Ursa

In the box below, describe Ursa in a few sentences, including her strengths and weaknesses.

How Others See Her

Pick one of the following characters: Vega, Captain Cassius or Yuri. How would they describe Ursa? Does their opinion of her change over the course of the story?

Characters

Ursa's Character Arc

One of the most important aspects of any story is the character arc. This is the way in which the character changes as a result of the events of the story. Describe how Ursa changes in a few sentences.

What Happens Next?

The end of the story is the start of a new life for all the surviving characters. What do you think Ursa will do now?

Characters

Sabik

Sabik is Ursa's ex-boyfriend, and he has a different attitude to the planet. He is excited to settle Beta Earth. The book is written from Ursa's point of view, but Sabik would interpret everything differently. The passage on the right describes how Ursa feels going into the forest with Sabik. How do you think Sabik would see the same scene? Write his description of entering the forest in the box below.

"I pause, feeling vulnerable. I rummage in my gear bag and pull out my wrench before following him. I hold it up as the woods swallow me whole.

This is worse than the path through the forest to the shuttle camp. Roots and undergrowth trip me. Thin branches reach down and try to scratch me. Glowferns swish at my ankles."

Fear and the Unknown

A central theme of *Tangled Planet* is facing your fears. For Ursa, that is the planet, the creature in the forest and the potential loss of the only home she's ever known. Think about the things you are afraid of. How do they make you feel? Describe your reactions in as much detail as possible in the box below, thinking about how they make both your body and mind respond.

When Ursa and the crew arrive on the planet, they have never been outside before. They have never felt the warmth of a sun or the impact of weather on their skin They have never seen nature, and only know the cramped corridors of the *Venture*.

Pick a character from the book, and describe how they felt when they stepped out of the shuttle and onto Beta for the first time. What did they find surprising? Use all of your senses in the description.

Arrival on Beta Earth

Using Current Science to Spark Story Ideas

The 'science' part of science fiction is an important one. Research into current science to speculate on future advances is part of writing for many science fiction authors. Researching current scientific advances can also help you come up with story ideas.

On the next page are a series of headlines from New Scientist magazine. Discuss what they make you think of, and write down one or two story ideas you get from these headlines in the box below.

The birds that steal fire

Arsonist falcons suggest our feathered friends found fire before we did

Mystery fossil may be a beast out of time

NASA dreams of Alpha Centauri trip

Alien worlds may have tides and air

DNA of man from 1827 built from living relatives

Mysterious streaks on Saturn's moons

Alien mountains can appear in planet shadows

The cosmic zoo

Sophisticated life forms will prove to be remarkably common in the universe, say Dirk Schulze-Makuch and William Bains

AI can hear a cardiac arrest

Giant ice cliffs dot Martian surface

Swarm of drones attacks airbase

MISSING LIMBS REGROWN

Massive bug hits world's computers

The peculiar family who don't feel pain

Zombie fungus hijacks fruit flies' brains

Cast-off moons doomed to roam the cosmos

Global weather goes haywire

A tiny space rock with a tinier moon

Exoplanet find makes star system our perfect match

Levitating particle whizzes around to paint 3D 'hologram'

Say no to human clones

GHOST SHIP

One way to reduce crew losses is to get rid of the crew

Spy balloons for catching pirates

Children get new ears

In a world first, children's own cells have been used to create replacement ears

Polar bears run up a high energy bill

Three-parent baby on the way in UK?

Our sun is part of a sprawling, chaotic, transgalactic family, finds Stephen Battersby

Global doom has not been ruled out

Tiny claws snatch pathogens from blood

Quick Quiz

1. What happened to Ursa's best friend, Maia?

2. What was Ursa's father's job on the *Venture*?

3. What tool does Ursa use to explore the air vents on the *Venture*?

4. Where is there no gravity on board the *Venture*?

5. What does Ursa find down the hidden path in the forest?

Answers

1. She dies after falling through the ice while exploring Beta.

2. He was Captain of the *Venture*.

3. A remote control programmed to stop the fans.

4. At the axis of the ship - the engine room.

5. A cottage or hut.