RECOMMENDED FOR
Lower secondary
(ages 13+; years 7 to 9)

CONTENTS

KEY CURRICULUM AREAS

- **Learning areas:** English

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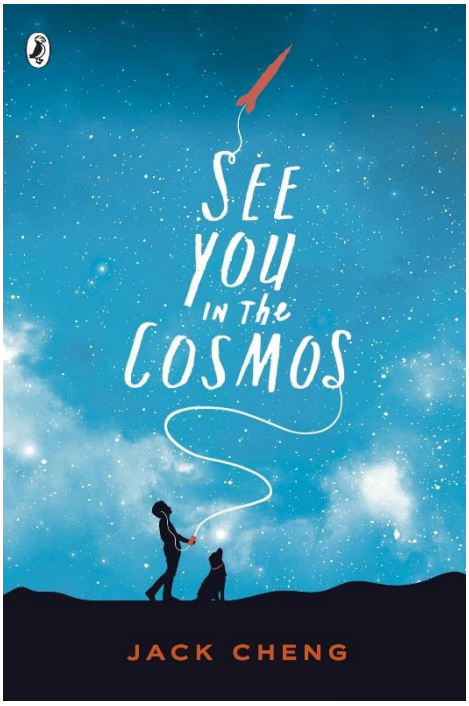

See You in the Cosmos

Jack Cheng

PLOT SUMMARY

All eleven-year old Alex wants is to launch his iPod into space. With a series of audio recordings, he will show other lifeforms out in the cosmos what life on Earth, his Earth, is really like.

But for a boy with a long-dead dad, a troubled mum, and a mostly-not-around brother, Alex struggles with the big questions. Where do I come from? Who's out there? And, above all, how can I be brave?

Determined to find the answers, Alex sets out on a remarkable road trip that will turn his whole world upside down . . .

ABOUT THE AUTHOR

Jack Cheng was born in Shanghai and grew up in Michigan. He spent nearly a decade in New York, working in advertising and tech. He lives in Detroit.

THE BOOK IN THE AUTHOR'S WORDS

Jack says:

The book's about Alex, an eleven-year-old whose hero is the astronomer Carl Sagan. Alex's dad died when he was little, his mom doesn't really pay attention to him, and his older brother lives in California. So he's pretty much alone, save for his dog (who is also named Carl Sagan), and he's trying to launch his own rocket into space. The book opens with him about to go to a rocket festival in the New Mexico desert.

Alex is following in his hero's footsteps. Like how Voyagers 1 and 2 have a Golden Record on them with sounds from earth—music, greetings in 55 languages, etc— Alex's rocket is going to have an iPod he's spray-painted gold, with sounds he's recording of life on Earth as HE sees it. The novel is a transcription of the recordings he makes on his iPod.

The book is partly me trying to imagine what it would've been like if, when I was eleven, instead of being interested in many different things I was obsessed about one thing, and I had no parent supervision AND the internet. How far could I have gotten?

SPACE AND TIME

Lesson Objective

- To read a passage and summarise the key details.
- To plan a fair science experiment to answer a question.
- To take measurements and record results accurately.

You Will Need

- Cardboard tubes (from kitchen/toilet rolls)
- Empty plastic bottles
- Coloured card
- Cardboard
- Scissors
- Sticky tape
- Metre rulers and tape measures.
- Rocket science work sheet (at the end of this resource)

Extract

From *'New Recording 14: 7M 47S'* pp. 68-70 (405 words)

[suggested illustration – front cover illustration]

[wind blowing]

[fabric fluttering]

...can't believe...[muffled]...still works...

I thought it was broken for sure.

[sniffling]

You guys are probably thinking... You're thinking how can he still be making recordings if Voyager 3 is in space?

Voyager 3 didn't make it into space. It didn't even go a hundred feet before...be...

[sniffling]

I'm not making any sense again.

I shouldn't have yelled at that kid Noah afterwards. I didn't mean to say that stuff about his dad doing all the work for him. I don't hate that kid, I just felt bad because my rocket failed and his went really high, and my rocket didn't even go half as high as his did. That rocket simulator didn't work at all...

I did apologize to Noah, though. He accepted my apology, and his dad said it's OK, it's no big deal. Everyone told me it's OK, they've all had rockets crash and there's always next time. I said I know there's next time but it's my fault that there wasn't this time.

I let my excitement get the better of me, and it left the worse of me behind, and the worse of me did a bad job of gluing Voyager 3 in the dark.

[sniffling]

On the Golden Record there isn't anything about the times our rockets failed, even though they did. That's because my hero wanted to put our best foot forward. He didn't want to put in anything about our rockets exploding because what if you guys saw that and thought we were trying to make them explode on your planet? Then you'd probably be scared and hide from us. Or maybe you'd try to blow us up before we could do it to you.

But my hero also said that knowledge is better than ignorance, and it's better to find out and embrace the truth even if that truth might not feel good. I wanted to put my best foot forward just like my hero, but I believe in the truth too, so that's why I'm telling you guys what happened... why I'm telling you my rocket crashed.

The worst part is that I was so close. I was here at SHARF and it was a beautiful day and I made so many new friends and they were all watching, and I could've prevented the crash if only I was more careful. Or if only I practiced launching my rocket ahead of time.

Starter Activity

Share the extract with the children and ask them to read this independently.

- What mistake did Alex make before launching his rocket? Discuss the importance of practice and testing in science.
- How could Alex have tested his rocket launch? Imagine that you are Alex and you have done your first test run.
- You want your rocket to fly as far as possible so what variables could you test to make sure you create the rocket that will travel the furthest?

Main Activity

Task One

1. Ask the children about common features of rocket ships and discuss the reasons for these features. Explain to the children that we are first going to try flying a rocket made of the main body and a nose. When we have tested this, we will add fins to the bottom of the rocket. Ask the children to record their predictions of what they think will happen when they add fins to their rockets using the resource: Rocket science. Will the rocket go further or not as far? Why?
2. Share the rocket building materials with the children. Ask them to work in pairs and to choose whether they want to use a cardboard tube or a plastic bottle for the main body of their rocket. Provide coloured card for the children to make a cone for the nose of their rocket. Demonstrate how to make a cone by drawing around a circular object (such as a roll of tape or a CD) and cutting a triangle out of it. Model how to twist this into a cone shape and secure it to the main body of the rocket using sticky tape. Ask them to draw a labelled diagram of their rocket and to list the equipment they have used on the resource: Rocket science.
3. Discuss fair testing and the importance of only changing one variable (i.e. the fins). Ask the children how we can make sure this is a fair test and ask them to record their ideas on the resource. Clarify that they should consider reducing as many variables as possible by using the same main rocket in their second run, and the same person should throw the rocket each time.
4. It's now time for the children to test their rockets! Find a large space to use and ask the children to have three attempts at throwing their rocket as far as they can. Use metre sticks and tape measures to measure the distance and ask the children to record their method, results and their observations using the resource: Rocket science.

Task Two

1. Demonstrate how to make and secure triangular fins to the base of the rocket.
2. Ask children to repeat their test as before. They should have three attempts at throwing the second rocket as far as they can. Again, they should use metre sticks and tape measures to measure the distance and record their method, results and observations using the resource: rocket science.

Task Three

1. The children should discuss their results with their partner. Which rocket travelled the furthest? Was their prediction correct? Ask them to record their ideas as a conclusion using the resource: rocket science.
2. Which material was best for the body of the rocket? Ask the children to circulate the class and compare their results with the other pairs. Overall, did the cardboard rockets travel further or the plastic ones?

Extension

Which other variables could we test? Ask the children to try making the fins from a different material such as tissue paper – does this affect their results? The children could also try making their fins in different shapes.

Plenary

Compile an email as a class to explain to Alex how he could make his plane go further and which variables he could try testing. Could the rockets we have made make it to space? Why not? Discuss that the materials we have used would not be suitable for space travel but that the concept of fins and aerodynamic features could still help Alex with his test.

DISCUSSION QUESTIONS

1. Alex's hero, Carl Sagan, said that "knowledge is better than ignorance, and it's better to find out and embrace the truth even if that truth might not feel good." Do you agree? Why/ why not?
2. Why do you think that the sound is muffled at the beginning of New Recording 14?
3. Why does Alex think it is his fault that his rocket launch failed?
4. What emotions did Alex feel towards Noah? Why?
5. Why might alien life misunderstand the sounds of rockets exploding on the Golden Record?
6. What do you imagine alien life might be like?
7. Some people argue that we shouldn't try to go to Mars or contact aliens because we have so many problems on Earth, such as global warming and wars, and some parts of Africa are without enough food or clean water. Carl Sagan said, "if we can do something that big, something that's never been done before in the history of humanity, then of course we can solve all the problems we have at home." What do you think? Who do you agree with? Why?
8. Alex wonders if aliens don't sleep as it might be daytime all the time on another planet. He suggests, "maybe you're just awake all the time because your planet spins so slowly that you're always facing the sun." How would the spinning of that planet be different from the way the Earth spins?

Worksheet: Rocket Science

What makes a rocket travel further?

We are going to test whether a rocket travels further with or without fins. Please write your prediction below. Do you think the rocket will go further with fins or without them? Can you explain why?

Prediction

Diagrams

Draw labelled diagrams of your rockets below.

Rocket one	Rocket two

Equipment

Fair Test

How will we make this a fair test? What will we change and what will we keep the same?

Method

Results

	Test one	Test two	Test three	Furthest distance
Rocket One				
Rocket Two				

Observations

Include some notes below about what you notice during your tests. Which rocket flew more smoothly, for example? Did the rockets travel in a straight line? Write down what you see happening.

Conclusion

Which rocket travelled the furthest? Was your prediction correct? Why do you think you got these results?

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