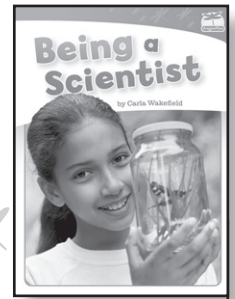


Being a Scientist Anchor Books

by Carla Wakefield



The *Being a Scientist* anchor books are written at three levels – emergent, early, and fluent – to enable differentiated instruction. Each anchor book has the same images but the text becomes progressively more challenging and appropriate at each level. This allows the students to have access to core information, regardless of their reading level.

The anchor books “front load” the vocabulary and introduce the “big ideas” that are expanded on in the topic books, as seen below.

Big Ideas for <i>Being a Scientist</i>	Scientists study plants and animals.	Scientists study Earth and space.	Scientists study what things are made from and how they change.	Scientists study how things work.
Emergent Topic Books	<i>Where Do Animals Live?</i>	<i>Up in Space</i>	<i>What Is It Made From?</i>	<i>How Does It Move?</i>
Early Topic Books	<i>Welcome to the Desert</i>	<i>Our Solar System by Martin</i>	<i>Making Glass</i>	<i>Machines That Move</i>
Fluent Topic Books	<i>Fantastic Dragonflies</i>	<i>Stars</i>	<i>From Tree to Paper</i>	<i>Let's Build a Bike</i>

Use the *Being a Scientist* anchor books to:

- introduce the big ideas and discuss key vocabulary during the whole-class introduction
- take guided reading lessons at three levels – emergent, early, and fluent
- lead into the associated topic books, where the students can read more about the big ideas that the anchor books introduce.



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Whole-class Introduction

A whole-class introduction to this anchor book enables all students, regardless of their reading ability, to discuss core content. It allows them to develop an understanding of the big ideas and vocabulary in the unit.

Anchor words

Emergent

animals, experiments, live, made, moon, move, questions, scientists, space, stars

Early

animals, change, data, discover, Earth, experiments, graphs, habitat, machines, made, materials, move, parts, planets, plants, questions, scientists, solar system, space, stars, tools, work

Fluent

animals, change, compare, data, discover, Earth, evidence, experiments, features, forces, graphs, habitat, liquid, machine, materials, move, parts, planets, plants, questions, record, rules, scientists, solar system, solid, space, stars, state, survive, tools, universe, work

Introductory activity

- Showing students artefacts related to the topic can help to spark their interest.
- Role-play and discussion prepares students by promoting conversation, questions, and speculation.

The teacher comes into the classroom wearing a lab coat and carrying a microscope, some test tubes, a magnifying glass, a notepad, and a pencil.

Sample outline of a possible script:

Thank you for inviting me to visit the class.

Do you know who I am?

Do you know what I do?

What questions would you like to ask about my job?

(Scaffold language if the students aren't forthcoming.)

Elicit information such as:

- I am a scientist.
- I am very curious about things in the world.
- I like to look at things carefully.
- I like to record what I see.

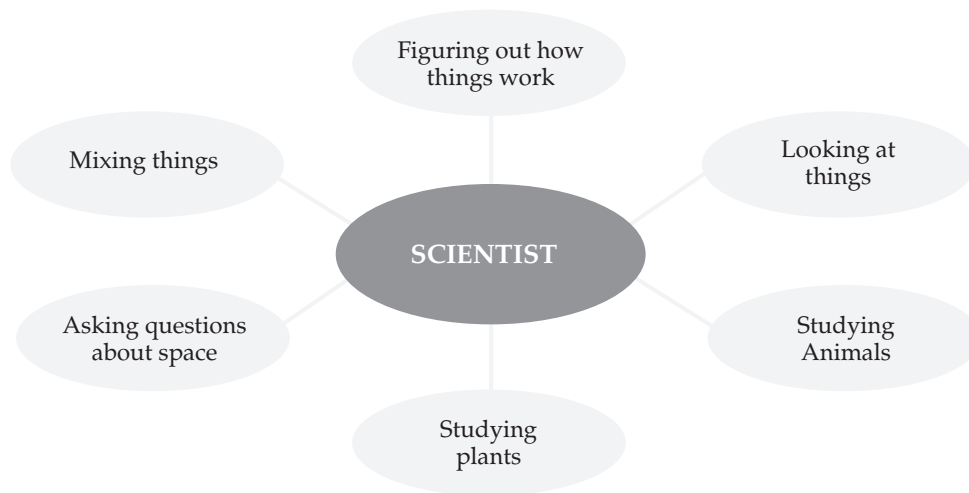
Visual walk-through

Identify which students will be using emergent, early, or fluent anchor books. Hand out the books. Proceed through the books, page by page, with the whole class. At this point, the students will not be reading the text. They will be responding to the **same images** to share and develop their vocabulary and to become familiar with the big ideas about being a scientist.

Use the visuals in the anchor books to promote discussion and develop a web of the big ideas.

- Record the students' words, ideas, and questions as they respond to the visual content of the books.
- Take opportunities to discuss and record the **big ideas** and the **anchor words** as they occur.
- Encourage the students to **make connections** with their own knowledge and experiences.





Attributes on the web could be:

- Looking at things
 - *Many of the photos show scientists looking at things. Why do you think the scientists are looking at things so closely?*
 - List the things the scientists are looking at.
 - *Describe a time when you looked at something very carefully to understand more about it. (Use your knowledge of the students to prompt them with specific examples such as a snail study or experiments with floating and sinking objects.)*
- Studying animals
 - *What animal would you want for a pet?*
 - *What would it need?*
 - *What kind of home would you need to give it?*
 - *What would its habitat be?*
- Studying plants
 - *What plants are growing around your house?*
 - *What do they need to survive?*
- Asking questions about space
 - *When you look up at the stars, what do you wonder about? What questions do you have?*
- Mixing things
 - Tell the students that when you mix things, it is fun to see how they change.
 - *What have you helped bake or cook at home or watched your mum or dad make?*
 - *Does an egg look like a cake? Milk? Sugar? Flour? All these materials are mixed together to make something quite different.*

- Figuring out how things work
 - *What kind of moving things can you build with your lego/meccano set? What are some of the parts you use? (wheels)*

Display the completed web. It can be referred to throughout the unit and reviewed at the conclusion of the unit.

Questions

List the students' questions on a separate chart and return to the list over the following days. Discuss any answers the students have found and add any further questions.

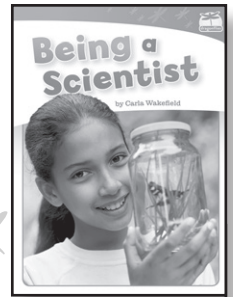
Conclusion

Explain to the students that they will be reading more about scientists.

- Tell them that they will be:
 - able to add to the charts as they find out more about how scientists work.
 - working in small groups to read their own book about being a scientist.

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Guided Reading Lesson – Emergent

Overview

This lesson builds on the whole-class introduction and expands on the Being a Scientist unit for emergent readers. It looks at what scientists do and the areas they study: plants and animals, space, what things are made from and how they change, and how things work.



Content standards

This book supports the following content standards:

- NS.K-4.1 Science as inquiry
- NS.K-4.2 Physical science
- NS.K-4.3 Life science
- NS.K-4.4 Earth and space science
- NS.K-4.5 Science and technology

Suggested purposes

This book supports the following **comprehension strategies**:

- making connections between prior knowledge and the text 
- identifying the main ideas 
- asking questions. 

It supports the following **non-fiction strategies**:

- reading and using graphs
- using photographs to support the meaning of the text.

Key vocabulary

The key vocabulary that is focused on includes:

- Anchor words – *animals, experiments, live, made, moon, move, questions, scientists, space, stars*
- High-frequency words – *a, and, are, at, do, I, in, look, to, up*

Features of the text

- Non-fiction features:
 - introduction of science concepts and anchor words associated with the topic
 - general information about scientists (pages 2 to 7), followed by four double-page spreads about specific kinds of scientists
 - personal statement that ends the book
 - preview question on the back cover
 - photographs with text that supports and illustrates concepts
 - graph
- Word study:
 - initial consonant blends – “pl-”, “sp-”
 - digraphs – “st”, “th”, “wh”, “wr”
 - silent “c” after “s”
- Use of questions marks and exclamation mark

Note: There is a lot of information in this book. You may like to cover it in two or more sessions. The first session could cover pages 2 to 7. You might take up to four sessions to cover the following four double-page spreads before concluding with page 16.



Setting the scene

If you have introduced the unit using the Whole-class Introduction, review the discussion and the charts that you made. If you haven't used this, choose ideas from the Introduction and encourage the students to make connections with their knowledge and experiences. Briefly introduce the big ideas, using the associated anchor words. List the anchor words, saying each one aloud, and briefly explain any unfamiliar words.

ELL support

It's important that ELL students take part in standards-based content study. Being immersed in academic, topic-specific language will help develop their language.

Introducing the book

Front cover – Show the cover to the students. Read aloud the title and author's name, then discuss the photograph. *What is the girl doing? Why do you think she is doing it?* Read aloud the title again. Focus on the anchor word "scientist". *Who has heard the word scientist before? When? Where?* Ask the students to think about books or TV program that have a scientific theme. Prompt them if necessary. *Have you ever read a book about turtles? Owls? Stars? Have you seen a TV program about an animal?* (Point out that the photo on the front cover is of a young girl and that children can be scientists too.)

Back cover – Read aloud the preview question. Discuss the students' predictions and record them on chart paper.

Title page – Draw the students' attention to the anchor word "scientist". Explain the silent "c" after "s". Have the students follow the letters with their fingers as they read. Say the word together several times.

The first reading

Pages 2 and 3 – Look at the photographs on page 2. **(Main idea)** *What is happening in these photos? What are these people doing?* (Scientists are learning about our world.) In pairs, the students can discuss each photograph, then share their ideas with the group. Look at page 3. Explain that an important part of being a scientist is asking questions. *What questions do you think this scientist is trying to answer?* **(Asking questions)** *What questions would you like to ask the scientist?*

Pages 4 and 5 – *What are the scientists doing? Why do you think they are doing that?* (Anchor word) *What is an "experiment"?* (Explain that an experiment can be as simple as trying different kinds of toothpaste to find out the best one.) *Why do scientists do experiments?* **(Making connections)** *Have you ever done an experiment? What? How? Why?* Bring in a magnifying glass and look closely at something. Explain that the microscope in the photo is like a magnifying glass.

Pages 6 and 7 – *What do you think the scientist on page 6 is doing? Look at page 7.* Explain that a graph is a way of recording and showing information. Help the students to make connections with graphs they have used or made, such as during maths. *What does this graph show? How many caterpillars did the scientist find? How many worms?*

Pages 8 and 9 – **(Main ideas)** Talk about where the scientist might be. *What has he found? What is he learning? What do scientists want to know about where animals and plants live? Why?* **(Making connections)** *How is where you live different from where snakes live? Ask the students to describe where they live. Is it in a city or a small town? What is the land like? What kind of house do you live in? What is it made from? What is the weather like? Discuss the importance of knowing these things. What kinds of places do different animals live? Why don't they all live in the same kind of place?*

Pages 10 and 11 – Write "moon", "stars", and "space" on the word wall. Discuss looking at the stars and the moon. Support the students with any words they find difficult. **(Main ideas)** *What is the scientist doing? What is he looking through?* Explain what a telescope is if the students don't know. *What do you think he is looking at? How do you think he is able to see the stars when they are so far away?* **(Making connections)** *What questions might he have about the moon and stars? What do you know about the moon and the stars? Have you ever looked through a telescope? What was it like?* Allow the students to share their experiences.

Pages 12 and 13 – Look at page 12. *Where do you think these scientists are?* Tell the students that these scientists are looking at the ice to see how it changes.

Do you know what ice is made from? Explain that ice is made from water and that when ice melts it changes into water. What makes it change from ice into water? Why would scientists want to know why it changes? Bring an ice cube to class. Record how long it takes to melt. How is an ice cube different from water?

Pages 14 and 15 – Look at the bicycle. (If possible, bring a bicycle into the classroom.) How does a bike move? Explain that a bicycle is a machine because it has moving parts that work together. Look at the photograph on page 14. Explain that your legs and feet make the chain turn metal rings like those in the photo. Where do these rings go on the bicycle? What other machines have parts like these? (egg beater, clock – show some examples) Why do scientists want to know how things move? (so they can invent new machines)

Page 16 – Would you like to be a scientist? Why/why not? If you were a scientist, what would you want to find out about? Revisit the chart from the beginning of the lesson.

Vocabulary activity

Focus word: plants

1. Reread page 9. Scientists look at where animals and plants live.
2. Say the word “plants” with me.
3. Explain that a plant is a living thing that grows in soil or water. A carrot is a plant that grows in the ground. A tree is a plant that grows in the ground. Seaweed is a plant that grows in water.
4. Tell the students that the word “plants” becomes “plant” when we take away “s”. The word “plant” can be used in different ways. It can mean to put a seed into the ground. I am going to buy some flower seeds and plant them in my garden. I’m going to buy a small tree and plant it in my garden. “Plant” can also mean a factory where things are made. I have a friend who works in a plant where they make tyres.
5. Brainstorm a list of plants. Sort them into groups (for example, large plants, small plants, plants you can eat). Ask the students to find out the names of some plants growing in their garden or neighbourhood. What is your favourite plant? Why? Have them share their responses with a partner.
6. What is the word we have been learning about today? Say “plants” with me.

ELL activity

Language objective: Creating a personal content dictionary

The students will need a small journal or notebook.

- Reread the text as shared reading. Write the following words on the board: animals, moon, plants, scientist, space, stars. Point to the words as you read them aloud. Explain that these words are important and will be in other books.
- Starting with “animals”, ask the students to think of different animals. Allow them time to draw several animals in their notebooks.
- Write a sentence with the group. “Dogs, cats, and snakes are all animals.” The students can copy the sentence into their notebooks. Ask them to underline “animal”.
- Repeat the process for “plants” and “scientist”.
- Look at “moon”, “stars”, and “space”. Ask the students what they know about space. What do you find in space? Encourage them to look at pages 10 and 11 for support. What do you see in the pictures? What is the scientist looking at?
- Ask the students to draw a picture of the moon and stars in their notebooks.
- Help them write a sentence about their picture. Have them underline the key words.
- The students can then reread all their pages with a partner.
- As you work through the unit, they can add content words to support their understanding of the big ideas.

Revisiting the text

1. Review and check

- Review the concepts and vocabulary in the book, identifying any that need further discussion or explanation.
- Identify and discuss the main idea in each section of the book.
- Help the students to reach a conclusion about being a scientist. For example, scientists are people who study things, and there are many different kinds of scientists.

2. Stop and learn

a. Decoding/word attack activities

Practising onset and rime

- Write “space” on the board. Say “space” with me.
- Erase “sp” and say “ace”.
- Let’s change the first part of the word to make some new words. (face, race, lace, pace) Discuss the meaning of each word.
- Repeat for “star”. (bar, car, jar, far)
- Put the words on the word wall.

- Review the words by playing guessing games, such as the one below:
 - *It is something you ride in.* (car)
 - *It is something you smile with.* (face)

BLM – Identifying the onset and rime of words
 The students can read the words “space” and “star”, then write new words below them. They can then draw two pictures.

b. Comprehension activity

BLM – Matching the sentences to pictures
 The students can read each sentence and draw a line to the correct picture. They can use the book to help them.

c. Writing activity

Show the front cover.

- *What questions might the girl have about the butterfly?*
- *Draw a picture of a butterfly.*
- *Write down one question you would like to ask.*

3. Suggestions for further activities

- Using the words and punctuation cards for this book, reassemble the words with the students.
- Create a class library of books relating to science and scientists.
- Have a scientist talk to the class about what he or she does.

Connecting with the topic books

The big ideas and anchor words in the anchor book are repeated and expanded on in the topic books. Select from these emergent books from the science unit to use in further guided reading lessons – *Where Do Animals Live?*, *Up in Space*, *What Is It Made From?*, and *How Does It Move?*

Unit Activities

These activities can be started after the introduction of the anchor book and throughout the reading of the topic books.

1. Learning centre

Include materials and activities so the students can become actively involved in building their understandings of the big ideas. For example:

- A wind-up clock so the students can see how it works
- Water containers, eye droppers, water, food colouring
- Cornflour and water mixture to see how things change from solid to liquid (Mix 4 cups of cornflour with 1 cup of water. Some food colouring could be added.)
- A globe
- Grow a bean plant – have paper and pencils available to record its progress
- A magnifying glass, binoculars, or a microscope to observe small objects
- An animal such as a pet mouse (Research its habitat. How can you make its home like its home in the wild? It doesn't have much space. Its habitat is small. How can you make it more interesting?)
- Lego, meccano, and other building sets.

2. Writing

Gives further practice with the anchor words: scientist, work, questions

Tell the students that they will be writing about a day in the life of a scientist. Have them visualise themselves as a scientist before writing. Ask the following questions to help them picture themselves as scientists.

- *What are you studying?*
- *Where are you? Where do you work?*
- *What are you curious about? What questions do you have?*
- *What are you wearing?*
- *Has anything exciting happened today?*

Ask the students to draw a picture and write a story about being a scientist for a day.

- **Emergent** – for the students at this level, the drawing will be the important part. Scribe their story if they need some help or get one of the students to buddy.
- **Early** – the students at this level should be able to write up to three sentences.
- **Fluent** – the students at this level should be able to develop a story of at least five sentences.

3. Graphing

Gives further practice with the anchor words – data, record, graph

- Have the students brainstorm questions that they would like to ask their classmates about bicycles.
What colour is your bike?
How long have you had your bike?
Who gave it to you?
- Ask the students to survey their classmates. Record the information on a graph.

4. Looking at change

Gives further practice with the anchor words – materials, tools

- Make a bowl of jelly. Describe the process as you do each step.
What materials and tools am I using to make the jelly?

5. Animals – habitat

Gives further practice with the anchor words – animal, plants, habitats

- Ask the students to choose their favorite animal. Have them visualise this animal.
What does it look like?
What is it doing?
Does it feel safe?
Where does it live?
What kind of plants are growing nearby?
Is there any water?
What else do you see?
What is its habitat?
- Ask the students to draw the animal in its habitat.
- They can then write about the animal and its habitat and an adventure it might be having.

6. Habitat lap sit

Explain that an animal's habitat includes food, water, shelter, and space for it to live.

- Ask the students to form a circle and hold hands, facing the centre.
- Walk around the circle and name the first student an animal, the next food, then water, then shelter, and then space. Repeat around the circle.
- Tell them that they are all holding hands because they all need to be there for the animal to live.
- Lap sit
 - Ask the students to drop their hands and close in so they are standing shoulder to shoulder.
 - Ask them to turn right so they are looking at the back of the head of the student in front of them. At the same time, they can take one step toward the centre of the circle. (They need to be standing close together.)

- Have the students place their hands on the shoulders of the person in front of them.
- Explain that you will count to three, and on three, the students are to sit down ... on the knees of the person behind them, keeping their own knees together to support the person in front.
- Explain that food, water, shelter, and space are all needed for the animal to live and survive in its habitat.
- Tell the students that there is no water because it hasn't rained in a long time. The students who are water should move out the circle. Watch the circle collapse.

7. Game: Planet Toss

You can play this game on the floor.

You will need: 8 containers, 8 objects per student (you could use bean bags or something similar)

- Label each container with the name of one of the planets.
- Place the containers (planets) on the floor in the correct position in relation to their orbit around the sun.
- Each student can then place themselves in the position of the sun. They have to try to throw an object into each container (planet).
- The further away containers have more points. The student who gets the most points wins.

8. Art

Gives further practice with the anchor words – stars, space

- Make a mobile of paper stars. (have instructions ready)
- Stars in space – making a crayon resist
 - You will need: crayons, black paint, paper
 - Draw stars or a constellation using brightly coloured crayons. Press hard.
 - Paint over with black paint. The paint won't stick to the crayon parts so the colourful picture will shine through.