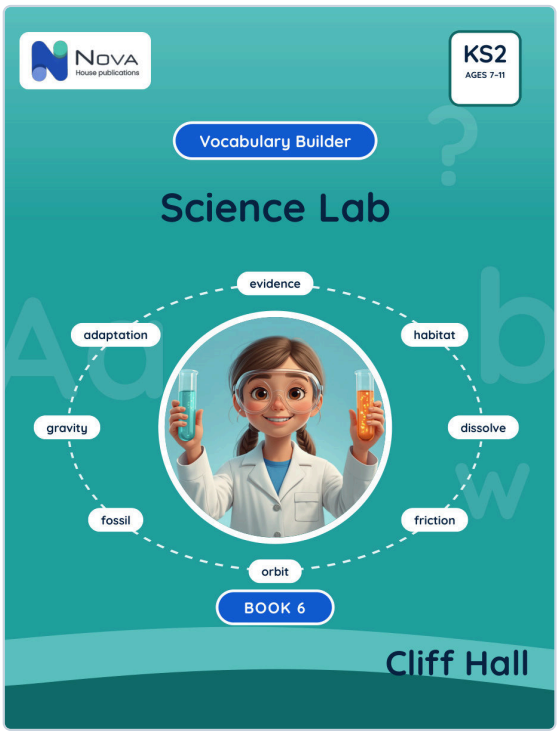
FREE SAMPLE PAGES

Vocabulary Builder

Book 6: Science Lab

Section 1: Working Scientifically



Inside this sample

p. 2	Section opener: Working Scientifically, with the word cloud
p. 3	Activity 1: What Is Working Scientifically?
p. 4	Activity 2: Five Ways to Investigate
p. 5	Activity 3: Understanding Variables
p. 6	Activity 4: Design a Fair Test
p. 7	Activity 5: Tools of the Trade
p. 8	Answers for Activities 1 to 5

1 Print
Print on A4 at home. Every page fits the sheet, so choose "Fit to page" if your printer asks.

2 Have a go
Let your child work through the activities at their own pace. Allow 30 to 40 minutes.

3 Check together
Use the answers on page 8 and talk through any new words.

About the book

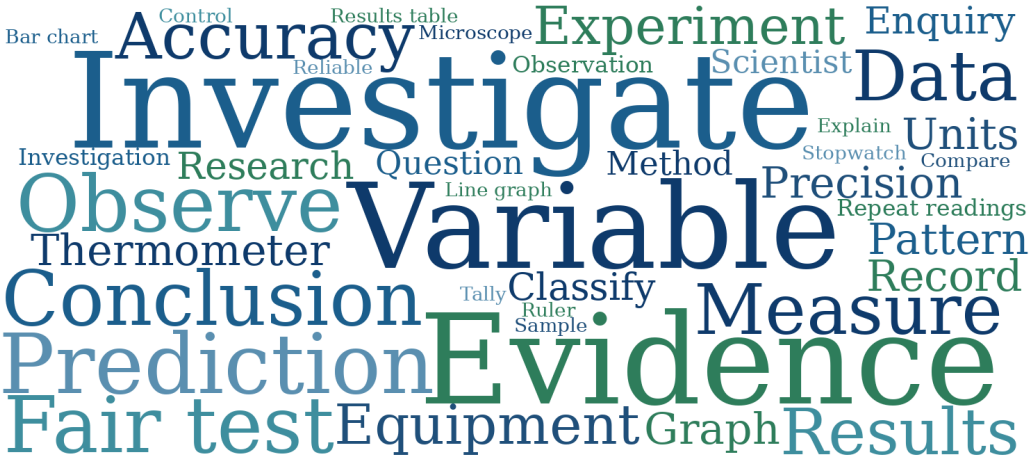
The key words of KS2 science, from habitats to circuits and space. Five sections cover working scientifically, biology, chemistry, physics, and Earth and space. For ages 7 to 11 (KS2) and beyond.

Find out more about the full book at novaeducation.uk

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Section 1

Working Scientifically



Look at the words in the word cloud above.

- Sort the words into three columns: Easy, Medium and Hard.
- When you have finished this section of the book, look at your columns again and decide if you would like to move any of the words.

Your notes and answers:

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Activity 1: What Is Working Scientifically?

Scientists use special words to describe how they find things out. Match each word to its meaning. Write the letter of the meaning in the box.

Word	Letter	Meaning
1. observation	☐	A. Something that can change in an investigation
2. variable	☐	B. Saying what you think will happen, and why
3. data	☐	C. Noticing and recording what happens, using your senses or equipment
4. prediction	☐	D. Facts or measurements collected during an investigation
5. conclusion	☐	E. A summary of what the results show



02

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Investigate (verb)

Definition:
To carry out a careful study in order to find out the facts about something.

Say it like:
in-VEST-ih-gate

Example:
We investigated which material kept an ice cube frozen for the longest time.

Synonyms and related terms:

1. explore
2. examine
3. look into

Word family:

1. investigation (noun): Our investigation lasted two weeks.
2. investigator (noun): The investigators recorded every result.

Activity 2: Five Ways to Investigate

Scientists do not always carry out the same kind of investigation. Read about the five types of enquiry, then decide which type each investigation below is. Write the letter on the line.

Letter	Type of enquiry	What it means
A	Fair testing	Changing one thing and keeping everything else the same
B	Observing over time	Watching and measuring how something changes over days, weeks or months
C	Pattern seeking	Looking for a link between two things, for example height and shoe size
D	Identifying and classifying	Sorting things into groups, often using a key
E	Research	Using books, websites or experts to find answers

1. Measuring a sunflower every week from April to September. _____
2. Finding out whether people with longer legs can jump further. _____
3. Sorting leaves into groups using a key. _____
4. Testing which paper towel soaks up the most water, using the same amount of water each time. _____
5. Using books and websites to find out how astronauts exercise in space. _____
6. Recording the temperature in the playground at 9 a.m. every day for a month. _____

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Activity 3: Understanding Variables

A variable is anything that can change in an investigation. Read the three kinds of variable, then answer the questions about the investigation below.

Variable	What it means
The variable I change (independent variable)	The one thing you change on purpose
The variable I measure (dependent variable)	What you measure or observe to see what happened
The variables I keep the same (control variables)	Everything else, kept the same to make the test fair

Zara's Plant Investigation

Zara wants to find out whether bean plants grow taller when they are given more water. She plants three bean seeds of the same type in three identical pots of soil. Every day she gives Pot A 50 ml of water, Pot B 100 ml and Pot C 150 ml. All three pots stand on the same sunny windowsill. After two weeks, she measures the height of each plant with a ruler.



1. What is the variable Zara changes?

2. What is the variable Zara measures?

3. Name two variables Zara keeps the same.

4. Why must all three pots stand on the same windowsill?

04

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Activity 4: Design a Fair Test

In a fair test you change only one variable and keep all the others the same. This means you can trust your results. Choose one question and plan a fair test to answer it.

- Does the type of soil affect how quickly seeds grow?
- Does exercise make your heart beat faster?
- Which material keeps an ice cube from melting for the longest?



My question:

My prediction (I think … because …):

The variable I will change:

The variable I will measure:

The variables I will keep the same:

> **Did you know?**
> The Large Hadron Collider, the biggest science experiment in the world, lies in a 27-kilometre tunnel under the border between France and Switzerland, near Geneva. More than 10,000 scientists and engineers from over 100 countries have worked on it.

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Meet the Scientist: Alhazen

The Scientist Who Tested His Ideas

Alhazen (his full name was Ibn al-Haytham) was born about a thousand years ago in the city of Basra, in what is now Iraq. He later worked in Cairo, in Egypt.

In Alhazen's time, many people believed that we see because our eyes send out rays of light. Alhazen did not simply accept this idea. He wanted evidence. He carried out careful experiments with light, using a dark room with a tiny hole in one wall. Light passing through the hole made an upside-down picture of the outside world on the opposite wall.

From his experiments, Alhazen concluded that we see because light travels from objects into our eyes. He wrote down his methods and results in his famous **Book of Optics**, so that other people could repeat his experiments and check them. Because he tested ideas instead of just accepting them, many people call Alhazen one of the first true scientists.

1. Where was Alhazen born?

2. What did many people believe about how we see?

3. Why did Alhazen write down his methods and results?

Activity 5: Tools of the Trade

Scientists use equipment to take accurate measurements. Match each tool to what it measures, then choose the correct unit from the word bank.



06

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Answers and Explanations

Section 1: Working Scientifically

Activity 1: What Is Working Scientifically?

1 C; 2 A; 3 D; 4 B; 5 E.

Activity 2: Five Ways to Investigate

1 B (observing over time); 2 C (pattern seeking); 3 D (identifying and classifying); 4 A (fair testing); 5 E (research); 6 B (observing over time).

Activity 3: Understanding Variables

1 The amount of water each plant is given. 2 The height of each plant. 3 Any two of: the type of seed, the size of pot, the type of soil, the amount of sunlight, the temperature, the length of time (two weeks). 4 So that the amount of sunlight is the same for every plant; only the water changes, which makes it a fair test.

Activity 4: Design a Fair Test

Answers will vary. Example (ice cube): change the material wrapped round the ice cube; measure the time it takes to melt; keep the same size of ice cube, the same thickness of material and the same room.

Meet the Scientist: Alhazen

1 In Basra, in what is now Iraq. 2 That our eyes send out rays of light. 3 So that other people could repeat his experiments and check his results.

Activity 5: Tools of the Trade

1 B, °C; 2 E, cm; 3 F, ml; 4 C, seconds; 5 A, grams; 6 D, newtons.

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Vocabulary Builder

Book 6: Science Lab

- Five sections, from Working Scientifically to Earth and Space
- Investigations, variables, fair tests and graphs
- Labelled diagrams, crosswords and spelling of scientific terms
- Answers and a full glossary at the back

Find it at novaeducation.uk →

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