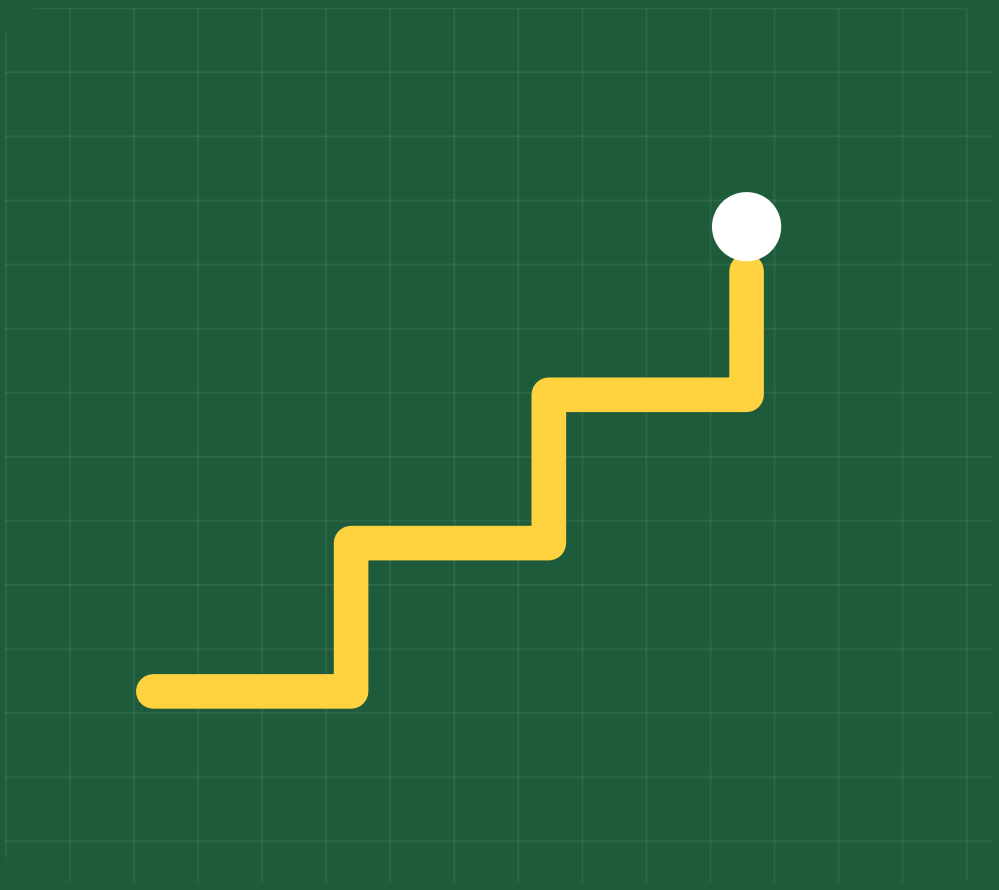
UpOnly Learning



GRADE 6

FREE SAMPLE WORKBOOK

Science Grade 6

One step at a time. · Ages 11–12 · Free sample: 1 of 8 topics

UO-SCI-6

OUR STORY

One step at a time

I'm Dr. Evan J. Hasson. I've run a specific chiropractic practice for over twelve years, and I'm a dad of three. My work is about alignment: get the structure right, and everything else works better.

At home, nothing was aligned. I was spending thousands a month on tutors, extracurriculars and programs, and when I asked about enrolling a second or third child the answer was always the same: that'll be double, that'll be triple. The charter school had a waiting list. The good public school had a waiting list. The private schools had the kind of list where it helps to know someone, or to give generously first.

And underneath all of it, the same quiet threat: if you don't pay for this, your child will fall behind. Not sold with evidence. Sold with fear.

So I did my own research, and here is what I found: none of it is secret. The standards are published. The order a child should learn in is written down and freely available. It is just scattered. Nobody had done the work of pulling it together, putting it in order and handing it over. So I did.

When every step has its place, confusion has nowhere to hide.

I built this for my own kids. I'm giving it to yours.

Dr. Evan J. Hasson, DC
Founder and dad of three

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No guaranteed results, and mistakes happen. Every student learns differently. We write and review every question and answer key carefully, and we still get things wrong. An answer key can be wrong, and a question can be worded badly or have two defensible answers. Check the answer key before you hand it over, and trust your own judgment over ours. Found a problem? **Photograph the page and email it to support@uponlylearning.com**. The picture tells us more than a description, and we fix it for every family.

Safety. Some activities use household items such as scissors, coins or food. An adult should supervise and skip anything unsafe for the student.

Not professional advice. This workbook does not replace an evaluation by a qualified educator or specialist. The founder is a Doctor of Chiropractic; UpOnly Learning does not provide medical or health advice.

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INTRODUCTION

How to use this workbook

Each topic follows the same steps, so your student always knows what comes next.

① **Quick Check.** 10 questions before you teach. Read them aloud for younger students. A high score means you can move faster.

② **Learn It.** Key words, step-by-step teaching with lines you can read aloud, worked examples and the mistakes to watch for.

③ **We Do It Together.** 10 questions you do side by side. The answer and the "why" are printed right after each question, so you can talk it through.

④ **You Try.** 10 questions your student does alone.

Answers with short explanations for every question are in the **Answer Key** at the end of each topic, so students can work without peeking. Go over each wrong answer together using the explanation.

This workbook is printed in full color. To save ink, choose "Black and white" or "Grayscale" in your printer settings; every page still works in black and white.

Want online checks that score themselves and track each student's progress? Visit uponlylearning.com.

GRADE 6

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Topic 1 · Cells: the building blocks of life **6**

Evidence that living things are made of cells, one cell or many types of cells MS-LS1-1

Quick Check 6 · Learn It 8 · We Do It Together 11 · You Try 13 · Answer Key 14

Cells: the building blocks of life

The student will gather and explain evidence that all living things are made of cells, and tell apart organisms made of one cell from organisms made of many different types of cells.

① Quick Check

Do this before the lesson. It shows what your student already knows. Score: ____ / 10

1. Which item was never part of a living thing?

A A frog **B** Salt **C** A leaf **D** A bacterium

2. Which organism is made of many cells?

A A bacterium **B** A paramecium **C** A mushroom **D** Yeast

3. What did Hooke see in thin slices of cork?

A Bacteria **B** Planets **C** Tiny boxes **D** Moving animals

4. What is the smallest unit that can carry out all the processes of life?

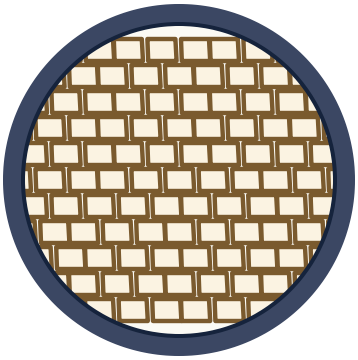
A An organ **B** An atom **C** A cell **D** A tissue

5. Mina sees tiny blobs moving in pond water under a microscope. What would show they are living?

A They are blue in the light of the microscope **B** They sink slowly to the bottom of the drop

C They are made of cells and take in food or divide

6. The drawing shows a thin slice of cork seen through a microscope, like the view Robert Hooke saw. What was important about what he saw?



A Moving specks he named germs **B** Box-like spaces he named cells

C Salt crystals he named minerals **D** Tiny grains he named atoms

4. Which of these is evidence for cell theory?

A One scientist guessed it was true once **B** Rocks and plastic are made of cells

C Every living thing examined has cells

5. Which list contains only living things?

A Salt, a tree, a mushroom, a frog **B** A leaf, a pebble, a frog, a tree

C A rock, a tree, a frog, a mushroom **D** A tree, a frog, a mushroom

6. A mushroom and a tree have cells but are different organisms. What does this show?

A Cells are only made of rock and soil **B** All cells in all organisms are identical copies

C Very different organisms are all made of cells **D** Only trees and plants are made of cells

7. Kai says germs are too small to be alive. What fact corrects his claim?

A A bacterium is one living cell **B** Germs are a kind of plastic dust

C Germs are a kind of rock from soil

② Learn It

MATERIALS an onion; a butter knife and cutting board (safety: adult does the cutting); a magnifying glass (or a phone camera zoomed in); a clear sandwich bag; a few grapes or a raw egg for the cell model (check for food allergies first; do not eat model materials; wash hands after handling raw egg); paper and pencil

Key words

- **cell**: the smallest unit that can carry out all the processes of life
- **organism**: any single living thing
- **unicellular**: made of just one cell, like a bacterium or an amoeba
- **multicellular**: made of many cells, usually of several different types
- **cell theory**: the scientific idea that all living things are made of cells, cells are the basic unit of life, and new cells come from existing cells
- **microscope**: a tool that magnifies tiny things so we can see cells

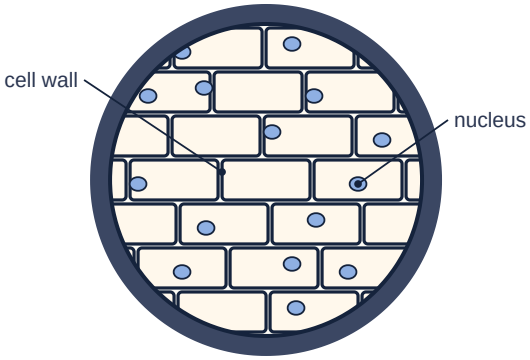
Warm-up

1. Ask the student to list five living things and five nonliving things in the room or outside.
2. Ask: what do all the living things have in common that the nonliving ones do not? Collect ideas such as growing, using energy, reproducing and responding.

> *Today we are going to find the one thing every living thing on Earth shares, from a whale to a germ.*

Teach

1. Explain that in the 1600s Robert Hooke looked at thin slices of cork through an early microscope and saw tiny boxes he called cells. Later Anton van Leeuwenhoek saw single-celled living things moving in pond water.
2. Explain cell theory in three parts: all living things are made of one or more cells; the cell is the basic unit of structure and function; new cells come from existing cells.
3. Have the adult cut the onion (keep onion juice away from eyes, and wash hands afterward). Peel the thin, see-through skin from the inside of one layer and lay it on the clear bag. Look with the magnifying glass. Explain that with a real microscope this skin shows rows of brick-shaped cells.



Unicellular	Multicellular
bacteria	plants
yeast	animals
amoebas	mushrooms

4. Compare unicellular organisms (bacteria, yeast, amoebas) with multicellular organisms (plants, animals, mushrooms). Point out that multicellular organisms have different cell types, like muscle, nerve, skin and blood cells in humans.
5. Stress the evidence: every living thing ever examined under a microscope has been made of cells; nonliving things like rocks, plastic and water are not.

> *Every living thing is made of cells. Some living things are just one cell, and some, like you, are trillions of cells working as a team.*

Guided practice

1. Together sort these into living (made of cells) or nonliving: a leaf, a pebble, a hair from your head (it grew from living cells), yeast, a plastic spoon, a mushroom, salt.

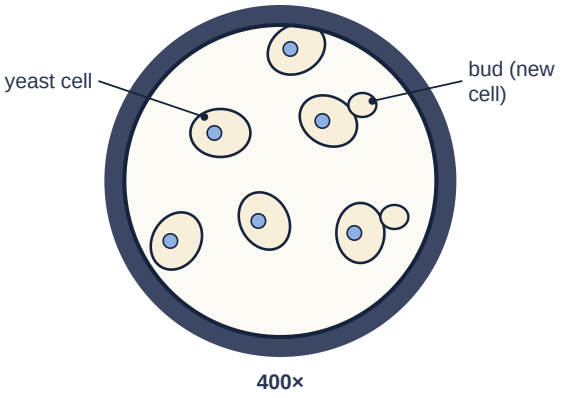
Item	Made of cells?	Ever alive?
a leaf		
a pebble		
a hair		
yeast		
a plastic spoon		
a mushroom		
salt		

2. Discuss why a dead leaf is still made of cells even though it is no longer alive, while a pebble never was.
3. Ask the student to explain how scientists know bacteria are alive even though we cannot see them without a microscope.

> *Let's be scientists. For each item, ask: is it made of cells, and was it ever alive?*

Worked examples

Is yeast unicellular or multicellular, and is it alive?



Yeast is a living, unicellular fungus. Each yeast cell carries out all life processes on its own: it takes in food, releases energy and reproduces by budding.

A student says a wooden table is made of cells. Is that true?
Yes, in a way. Wood comes from a tree, so it is made of the dead cell walls of tree cells. The table is not alive now, but its material came from living cells. A metal table is not made of cells.

Watch for these mistakes

Mistake: Only animals and plants are made of cells; tiny germs are too small to have cells.
Fix: A bacterium is itself a single cell. Being small does not mean having no cells; it means the whole organism is one cell.

Mistake: Bigger animals have bigger cells.
Fix: An elephant and a mouse have cells of roughly similar size. The elephant is bigger because it has far more cells, not bigger ones.

PARENT TIP If you can borrow or buy an inexpensive student microscope, onion skin and a cheek swab smear are classic first slides; otherwise, search for labeled microscope photos of cells to compare with the student's drawing.

GO FURTHER Ask: what do you think will happen? Mix a pinch of dry yeast with warm (not hot) tap water and a spoon of sugar in a cup, and set up a second cup with no yeast to compare. Do not taste the mixture. Watch for foam over 15 minutes, measure and record the foam height every 5 minutes, then explain what happened and how this shows yeast cells are alive and using food.

③ We Do It Together: 10 questions

> *Do these side by side. Read each question together, let your student answer, then read the answer and the "why" right below it and talk it through.*

1. What do human bodies have?

A Only one cell **B** No cells **C** Many types of cells **D** Only one type of cell

> **Answer: C** Many types of cells
> **Why:** The body has muscle, nerve, skin and blood cells.

2. Who first named cells after looking at cork under a microscope?

A Isaac Newton **B** Anton van Leeuwenhoek **C** Marie Curie **D** Robert Hooke

> **Answer: D** Robert Hooke
> **Why:** Hooke saw tiny box-like spaces in thin cork slices and named them cells.

3. Which is made of cells?

A A grain of salt **B** A smooth pebble **C** A drop of water **D** A mushroom

> **Answer: D** A mushroom
> **Why:** A mushroom is a living fungus built from many cells.

4. Which idea belongs to cell theory?

A New cells are never alive when they form **B** New cells come from rocks and water

C New cells come from existing cells **D** New cells appear from nothing at all

> **Answer: C** New cells come from existing cells
> **Why:** Cells are made when an existing cell divides, not from nonliving matter.

5. Is a pebble made of cells?

A Yes, pebbles are tiny animals **B** Yes, pebbles are plants **C** No, it never was alive

> **Answer: C** No, it never was alive
> **Why:** A pebble is a nonliving mineral and was never part of a living thing.

5. Which group contains only unicellular organisms?

A Mushrooms, ferns and bacteria **B** Cats, frogs and trees **C** Amoebas, dogs and yeast

D Bacteria, amoebas and yeast

> **Answer: D** Bacteria, amoebas and yeast
> **Why:** Bacteria, amoebas and yeast are each a single cell, unlike cats, trees or mushrooms.

6. What was important about what Leeuwenhoek saw in pond water?

A Tiny planets floating by in the water **B** Rocks that moved on their own power

C Living things made of single cells

> **Answer: C** Living things made of single cells
> **Why:** He saw unicellular organisms moving, the first look at single-celled life.

7. Why are bacteria alive even though we cannot see them without a microscope?

A They are tiny pieces of broken rock **B** They are large enough to see by eye alone

C They are drops of plain water **D** Each is a cell carrying out life processes

> **Answer: D** Each is a cell carrying out life processes
> **Why:** Being small does not make something nonliving.

8. Which fact shows the flaw in this reasoning: "It moves, so it is alive"?

A Moving objects are cells **B** Moving is never necessary **C** All living things move quickly

D Some nonliving things move

> **Answer: D** Some nonliving things move
> **Why:** A rolling stone or drifting object moves without being alive.

9. Three students sort objects. Which sorting is correct?

A Living: yeast, tree; nonliving: salt, plastic **B** Living: plastic, yeast; nonliving: salt, tree

C Living: rock, frog; nonliving: yeast, tree **D** Living: salt, tree; nonliving: yeast, plastic

> **Answer: A** Living: yeast, tree; nonliving: salt, plastic
> **Why:** Yeast and trees are made of cells; salt and plastic are not.

④ You Try: 10 questions

Now your student works alone. Check answers in the Answer Key at the end of this topic. Score: ____ / 10

1. Which would you most need to see a bacterium?

A A kitchen scale **B** A ruler with small marks **C** A microscope

2. A rock grows bigger by adding minerals. Does that make it alive?

A Yes, because it is large and heavy **B** Yes, because anything that grows is alive

C No, it has no cells or life processes **D** Yes, because it is hard and lasting

3. What does unicellular mean?

A Made of just one cell **B** Made of one organ only **C** Made of no cells at all

D Made of many different cells

4. Which is the best description of a tissue?

A Similar cells working together **B** A tiny organ system in the body **C** A single cell with a nucleus

D A small piece of rock in the body

5. Why did the microscope matter for discovering cells?

A Cells only give off invisible light **B** Cells did not exist before microscopes

C Most cells are too small to see by eye **D** Cells were hidden under the water

6. Which activity helps you see cells in an onion?

A Weigh the whole onion on a scale **B** Smell the onion from far away **C** Look at thin skin with a magnifier

D Boil the whole onion in water first

7. Your body has skin, muscle and nerve cells. What does this tell you about the kind of organism you are?

A You have no cells of your own **B** You are multicellular with many cell types

C You are a single large tissue **D** You are unicellular with many jobs

8. Which sample best shows that an organism is multicellular?

A A pebble from a stream **B** A leaf with different tissues **C** A single yeast cell in water

D A single bacterium on a slide

9. Which sentence correctly uses the terms organism and cell?

A An organism is made of one or more cells **B** An organism is a nonliving kind of rock

C A cell is made of many whole organisms

10. Which evidence would best convince you a pond blob is a single-celled organism?

A One cell that moves, eats and divides **B** It is round in shape and clear in color

C It is green in color and shiny in light

Cells: the building blocks of life: Answers and explanations

① Quick Check

1. Which item was never part of a living thing?
   B Salt
   Salt is a nonliving mineral, while leaves, frogs and bacteria are made of cells.

2. Which organism is made of many cells?
   C A mushroom
   A mushroom has many cells, while yeast, a bacterium and a paramecium are each one cell.

3. What did Hooke see in thin slices of cork?
   C Tiny boxes
   He saw tiny box-like spaces and named them cells, from a word for small rooms.

4. What is the smallest unit that can carry out all the processes of life?
   C A cell
   A single cell can take in food, release energy, grow and reproduce. An atom is not alive, and tissues and organs are made of many cells.

5. Mina sees tiny blobs moving in pond water under a microscope. What would show they are living?
   C They are made of cells and take in food or divide
   Cells and life processes such as eating and dividing are evidence of life.

6. The drawing shows a thin slice of cork seen through a microscope, like the view Robert Hooke saw. What was important about what he saw?
   B Box-like spaces he named cells
   He named the box-like compartments cells.

7. Which of these is evidence for cell theory?
   C Every living thing examined has cells
   Many observations of living things support it.

8. Which list contains only living things?
   D A tree, a frog, a mushroom
   Each organism in the correct list is made of cells; rocks, pebbles and salt are not.

9. A mushroom and a tree have cells but are different organisms. What does this show?
   C Very different organisms are all made of cells
   A fungus and a plant are very different, yet both are made of cells. This supports cell theory for many kinds of living things.

10. Kai says germs are too small to be alive. What fact corrects his claim?
    A A bacterium is one living cell
    Small does not mean nonliving.

④ You Try

1. Which would you most need to see a bacterium?
   C A microscope
   Bacteria are too small to see without magnification.

2. A rock grows bigger by adding minerals. Does that make it alive?
   C No, it has no cells or life processes
   Growing alone does not make something alive; living things need cells and life processes.

3. What does unicellular mean?
   A Made of just one cell
   Uni means one, so a unicellular organism is a single cell.

4. Which is the best description of a tissue?
   A Similar cells working together
   Many similar cells that work together form a tissue.

5. Why did the microscope matter for discovering cells?
   C Most cells are too small to see by eye
   Microscopes magnify tiny things, so cells could finally be seen.

6. Which activity helps you see cells in an onion?
   C Look at thin skin with a magnifier
   A thin see-through layer shows rows of cells under magnification.

7. Your body has skin, muscle and nerve cells. What does this tell you about the kind of organism you are?
   B You are multicellular with many cell types
   Different cell types do different jobs, which is typical of a multicellular organism.

8. Which sample best shows that an organism is multicellular?
   B A leaf with different tissues
   A leaf has several tissues, each made of many cells, which shows the plant it came from is multicellular.

9. Which sentence correctly uses the terms organism and cell?
   A An organism is made of one or more cells
   Organisms are made of cells; a cell is the smallest unit of life.

10. Which evidence would best convince you a pond blob is a single-celled organism?
    A One cell that moves, eats and divides
    One cell showing life processes is strong evidence.

THE FULL WORKBOOK

Keep going with the full Science workbook

You just tried one topic. The full Grade 6 workbook has every topic below, each with a Quick Check, a lesson, We Do It Together, up to 90 You Try questions, Show What You Know and a full answer key.

1. Cells: the building blocks of life MS-LS1-1
2. Cell parts and what they do MS-LS1-2
3. Body systems working together MS-LS1-3
4. Atoms and molecules MS-PS1-1
5. States of matter and particle motion MS-PS1-4
6. The water cycle MS-ESS2-4
7. Moon phases, eclipses and seasons MS-ESS1-1
8. Air masses, fronts and changing weather MS-ESS2-5

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One step at a time.

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