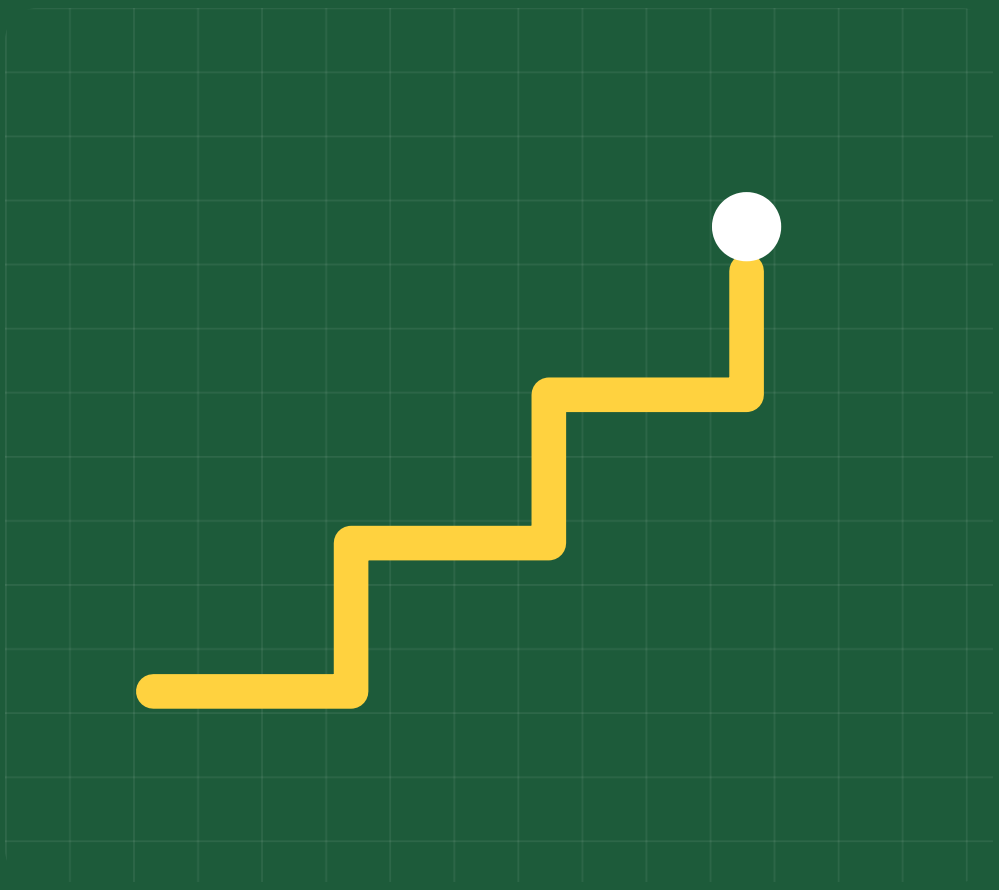
UpOnly Learning



GRADE 3

FREE SAMPLE WORKBOOK

Science Grade 3

One step at a time. · Ages 8–9 · Free sample: 1 of 8 topics

UO-SCI-3

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.

Full terms: uponlylearning.com/legal

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 3

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Topic 1 · Balanced and unbalanced forces **6**

Pushes and pulls; balanced forces keep motion the same, unbalanced forces change it 3-PS2-1

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Balanced and unbalanced forces

The student will explain, using a simple investigation, that balanced forces leave an object's motion unchanged and unbalanced forces change it.

① Quick Check

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

1. Which of these is a pull?

A Shoving a shopping cart forward **B** Tugging a sock off your foot **C** Throwing a ball **D** Pressing a doorbell

2. Forces that do NOT cancel each other out are called...

A equal forces **B** unbalanced forces **C** still forces **D** fully balanced forces

3. A ball is rolling and you stop it with your hand. What kind of force did your hand give?

A An unbalanced force **B** Only gravity **C** No force **D** A fully balanced force

4. Opening a refrigerator door by its handle is a...

A push **B** not a force **C** balanced force **D** pull

5. Max says, 'A rock on the ground has no forces on it because it is not moving.' What is wrong with his idea?

A Only big rocks have forces **B** Nothing is wrong **C** Forces do act on it, but they are balanced **D** Rocks are always moving a little bit all the time

6. Nia pushes a heavy chair, but it does not move. What does this tell you?

A The forces are unbalanced **B** Her push is balanced by friction from the floor **C** There is no gravity on the chair at all in the room **D** Her push is not a force

7. A ball is thrown straight up into the air. Why does it come back down?

A Gravity is an unbalanced force pulling it down **B** The throw keeps pushing it down all the way to the ground **C** The air pushes it down hard **D** The forces on it are balanced

3. Lucas pushes the box to the right and Ella pushes it to the left. Look at the force arrows. What is true?



A The box moves right **B** The forces are unbalanced and the box moves away **C** The box moves left

D The forces are balanced and the box stays still

4. A hanging lamp is still. Then its chain breaks. What happens and why?

A It falls because gravity is no longer balanced **B** It moves sideways

C It stays because the forces are balanced **D** It floats in the air

5. A box has 10 units pushing right and 10 units pushing left. Then the left push drops to 6 units. What happens?

A The box starts moving left **B** The box starts moving right **C** The box stays still

D The box moves up

② Learn It

MATERIALS a toy car or small ball; a hand towel; a sturdy box or stack of books; a piece of string or ribbon about 1 meter long; a stuffed animal; paper and pencil

Key words

- **force**: a push or a pull on an object
- **balanced forces**: pushes or pulls that are equal in strength and opposite in direction, so they cancel out
- **unbalanced forces**: pushes or pulls that do not cancel out, so the object starts moving, stops, speeds up, slows down or changes direction
- **motion**: a change in an object's position
- **direction**: the way something is going, like left, right, up or down

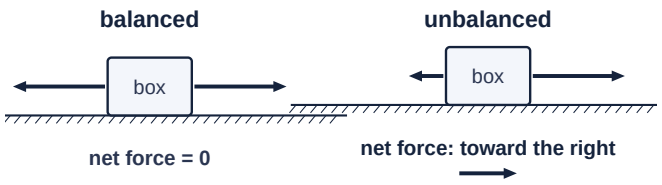
Warm-up

1. Place the toy car on the floor. Ask: What would make it move?
2. Let the student push it, then pull it with the string. Name each one: push or pull.
3. List three pushes and three pulls from daily life (opening a door, kicking a ball, pulling a wagon).

> *Every time something starts moving or stops, a push or a pull is behind it. Let's become force detectives.*

Teach

1. Explain that a force is a push or a pull, and every force has a strength and a direction.
2. Hold a stuffed animal between your two hands and press gently from both sides with equal strength. It does not move: the forces are balanced.
3. Now press harder with one hand. It slides toward the weaker side: the forces are unbalanced.
4. Show that a book resting on a table has balanced forces too: gravity pulls it down and the table pushes it up.
5. Draw two arrows of the same length pointing at each other for balanced, and one long and one short arrow for unbalanced.



> *When the pushes and pulls are equal and opposite, they cancel and nothing about the motion changes. When one side wins, the motion changes.*

Guided practice

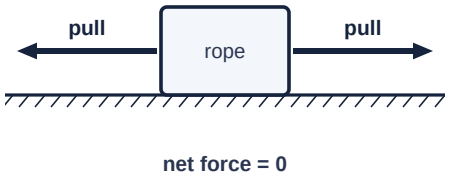
1. Ask: What do you think will happen if we both pull just as hard? Then play a gentle tug-of-war with the towel, standing on a rug or grass with nothing hard behind you. First pull equally so the towel stays still. Then let the student pull harder so the towel moves toward them.
2. After each round, ask: Balanced or unbalanced? Which way did it move?
3. Roll the toy car and stop it with a book. Ask: Was the stopping force balanced or unbalanced? (Unbalanced: it changed the motion.)
4. Record each test in a two-column table: What happened / Balanced or unbalanced. Then ask: What happened and why?

What happened	Balanced or unbalanced?
Towel stayed still	balanced
Towel moved	
Car stopped by book	

> *Pull with me just as hard as I pull. Now pull harder. What happened to the towel?*

Worked examples

Two kids pull on opposite ends of a rope with the same strength. What happens to the rope?



The rope stays still. The forces are equal and opposite, so they are balanced and the motion does not change.

A soccer ball is sitting still on the grass. Maya kicks it. Were the forces on the ball balanced or unbalanced during the kick?



Unbalanced. The kick was a push that was not cancelled out, so the ball started to move.

Watch for these mistakes

Mistake: If an object is not moving, there are no forces on it.
Fix: Point to a book on the table: gravity pulls it down and the table pushes up. There are forces, they are just balanced.

Mistake: A moving object always needs a push to keep moving.
Fix: Roll a ball on a smooth floor; it keeps rolling and slows only because friction (a force) acts on it. Changes in motion need an unbalanced force; steady motion does not need extra pushing if nothing is slowing it.

PARENT TIP Whenever the student sees something start, stop or turn, ask: Was that balanced or unbalanced? Quick everyday questions make the idea stick.

GO FURTHER Build a ramp from a book and a board. Predict which surface will stop the car fastest, then roll the toy car down and use different surfaces at the bottom (towel, floor, foil) and watch which unbalanced friction force stops it fastest. Record the distances in a table and explain what happened.

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. Which of these shows a force that makes something stop?

A A car parked in a garage **B** A goalie catching a ball **C** A cup on a table

D A ball sitting on a shelf

Answer: B A goalie catching a ball
Why: The goalie's hands push on the ball and stop its motion.

2. Which of these shows unbalanced forces?

A A parked bike **B** A picture hanging still on a wall in the hall **C** A ball starting to roll after a kick

D A lamp sitting on a desk

Answer: C A ball starting to roll after a kick
Why: The ball's motion changed from still to rolling, so the forces were unbalanced.

8. On a force arrow, what does a longer arrow show?

A That the object is not moving **B** A stronger force **C** That the force is a pull **D** A weaker force

> **Answer: B** A stronger force
> **Why:** The longer the arrow, the stronger the push or pull.

9. Zoe pushes a toy boat across the bathtub. Which way does the boat move?

A Toward Zoe **B** In the direction of her push **C** It does not move at all, ever **D** Straight up

> **Answer: B** In the direction of her push
> **Why:** Her push is an unbalanced force, so the boat moves the way she pushes.

10. A crate has two equal force arrows pointing in opposite directions. What will happen to the crate's motion?

A It will turn **B** It will speed up **C** It will start moving right **D** It will stay the same

> **Answer: D** It will stay the same
> **Why:** Equal and opposite arrows show balanced forces, which do not change motion.

11. Team North pulls a rope with 10 units of force. Team South pulls with 10 units. What happens to the rope?

A It moves up **B** It stays still **C** It moves north **D** It moves south

> **Answer: B** It stays still
> **Why:** The pulls are equal and opposite, so the forces are balanced.

12. A car drives at a steady speed in a straight line. Which is true?

A There are no forces on it **B** It must be slowing down **C** The forces on it are balanced
D There must be an unbalanced force making it faster

> **Answer: C** The forces on it are balanced
> **Why:** Its speed and direction are not changing, so the engine's push is balanced by friction and air.

13. A bowling ball rolls into a still pin, and the pin starts to move. Why?

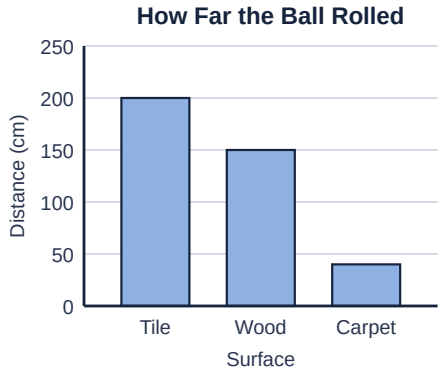
A The forces on the pin stayed fully balanced **B** The pin moved on its own
C The ball gave the pin an unbalanced push **D** Gravity pushed the pin sideways

> **Answer: C** The ball gave the pin an unbalanced push
> **Why:** The pin's motion changed, so an unbalanced force acted on it.

2. Use the words balanced and unbalanced to explain what happens to a soccer ball as it sits still, gets kicked, then rolls to a stop in the grass.

Answer: Sitting still: forces are balanced. Kick: an unbalanced push starts it moving. Rolling to a stop: friction from the grass is an unbalanced force that slows and stops it.
Why: Every change in the ball's motion comes from an unbalanced force; no change means balanced.

3. A ball got the same push on three surfaces. Look at the bar graph. Which surface had the most friction?



A They were all the same **B** Carpet **C** Tile **D** Wood

Answer: B Carpet
Why: The ball went the shortest distance on carpet, so the force slowing it was strongest there.

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. What happens to an object when the forces on it are balanced?

A It speeds up **B** It always stops **C** It changes direction right away **D** Its motion stays the same

2. What is the force that slows a sliding object when it rubs against a surface?

A Friction **B** Balance **C** Strong gravity **D** Motion

3. Which word means a push or a pull on an object?

A direction **B** speed **C** motion **D** force

4. Which pair of forces is balanced?

A 2 units right and 6 units left **B** 6 units right and 4 units left **C** 6 units right and 6 units left **D** 6 units right and 0 units left

5. A moving skateboard turns to the left when Ava leans. What does the turn tell you?

A The skateboard stopped moving right away **B** No force acted on it **C** An unbalanced force acted on it **D** The forces stayed balanced

6. A toy boat floats still in a tub. Gravity pulls it down. What else is happening?

A The air pushes it sideways **B** Nothing else is acting on it **C** The water pulls it down too a little **D** The water pushes up just as hard

7. Which is an example of balanced forces on a playground?

A A swing being pushed higher **B** A ball being thrown **C** A kid sliding faster and faster down a slide **D** Two kids pulling a jump rope equally so it stays still

8. A cart is rolling to the right at a steady speed, and the forces on it are balanced. If nothing changes, what will it do next?

A Turn around **B** Speed up **C** Stop right away **D** Keep moving right at the same speed

9. Plan a test to find out whether a ball rolls farther on grass or on a sidewalk. Tell what you change, what you keep the same and what you measure.

10. A swing is pushed once. It goes back and forth, getting a little lower each time. Why?

A Gravity turns off **B** Friction and air keep slowing it **C** The forces are balanced **D** The swing gets lighter

Balanced and unbalanced forces: Answers and explanations

① Quick Check

1. Which of these is a pull?
   B Tugging a sock off your foot
   Tugging moves the sock toward you, which is a pull.

2. Forces that do NOT cancel each other out are called...
   B unbalanced forces
   When forces do not cancel out, they are unbalanced and the motion changes.

3. A ball is rolling and you stop it with your hand. What kind of force did your hand give?
   A An unbalanced force
   The ball's motion changed (it stopped), so the force was unbalanced.

4. Opening a refrigerator door by its handle is a...
   D pull
   You move the door toward you, so it is a pull.

5. Max says, 'A rock on the ground has no forces on it because it is not moving.' What is wrong with his idea?
   C Forces do act on it, but they are balanced
   Gravity pulls the rock down and the ground pushes up. Not moving means balanced, not zero forces.

6. Nia pushes a heavy chair, but it does not move. What does this tell you?
   B Her push is balanced by friction from the floor
   The chair's motion did not change, so something pushed back just as hard: friction.

7. A ball is thrown straight up into the air. Why does it come back down?
   A Gravity is an unbalanced force pulling it down
   Gravity keeps pulling the ball down, slowing it, then pulling it back to the ground.

8. Lucas pushes the box to the right and Ella pushes it to the left. Look at the force arrows. What is true?
   D The forces are balanced and the box stays still
   5 units right and 5 units left are equal and opposite, so they cancel out.

9. A hanging lamp is still. Then its chain breaks. What happens and why?
   A It falls because gravity is no longer balanced
   The chain's pull is gone, so nothing cancels gravity and the lamp falls.

10. A box has 10 units pushing right and 10 units pushing left. Then the left push drops to 6 units. What happens?
    B The box starts moving right
    Now 10 right is more than 6 left, so the forces are unbalanced toward the right.

④ You Try

1. What happens to an object when the forces on it are balanced?
   D Its motion stays the same
   Balanced forces cancel out, so the object's motion does not change.

2. What is the force that slows a sliding object when it rubs against a surface?
   A Friction
   Friction acts when surfaces rub, and it works against motion.

3. Which word means a push or a pull on an object?
   D force
   A force is any push or pull on an object.

4. Which pair of forces is balanced?
   C 6 units right and 6 units left
   Balanced forces are equal in strength and opposite in direction.

5. A moving skateboard turns to the left when Ava leans. What does the turn tell you?
   C An unbalanced force acted on it
   Changing direction is a change in motion, so a force was unbalanced.

6. A toy boat floats still in a tub. Gravity pulls it down. What else is happening?
   D The water pushes up just as hard
   The boat is still, so the water's push up balances gravity's pull down.

7. Which is an example of balanced forces on a playground?
   D Two kids pulling a jump rope equally so it stays still
   Equal, opposite pulls cancel out, so the rope does not move.

8. A cart is rolling to the right at a steady speed, and the forces on it are balanced. If nothing changes, what will it do next?
   D Keep moving right at the same speed
   Balanced forces keep motion the same, even when the object is already moving.

9. Plan a test to find out whether a ball rolls farther on grass or on a sidewalk. Tell what you change, what you keep the same and what you measure.
   Change only the surface (grass or sidewalk). Keep the same ball, the same push (for example rolling it down the same ramp) and the same starting spot. Measure how far the ball rolls each time, and repeat a few times.
   A fair test changes one thing, keeps the rest the same and measures the result.

10. A swing is pushed once. It goes back and forth, getting a little lower each time. Why?
    B Friction and air keep slowing it
    Friction and air push against its motion, so each swing is a bit smaller.

THE FULL WORKBOOK

Keep going with the full Science workbook

You just tried one topic. The full Grade 3 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. Balanced and unbalanced forces 3-PS2-1
2. Magnets and static electricity 3-PS2-3
3. Life cycles of living things 3-LS1-1
4. Inherited traits 3-LS3-1
5. Habitats and survival 3-LS4-3
6. Weather data and patterns 3-ESS2-1
7. Climates around the world 3-ESS2-2
8. Criteria and constraints 3-5-ETS1-1

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