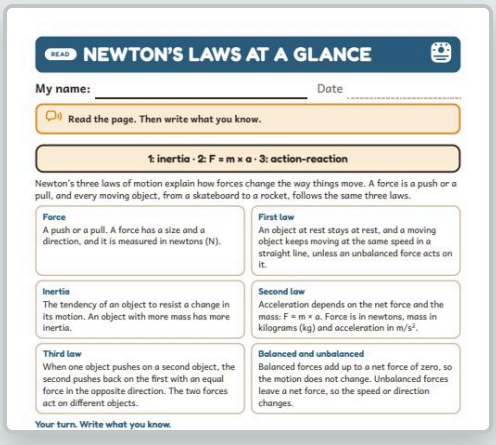
6TH–8TH GRADE · SCIENCE

FORCE AND MOTION

NEWTONS LAWS OF MOTION WORKSHEETS

Label a force diagram, match clues to terms, solve F = m x a problems, read data and draw the graph, sort balanced and unbalanced forces, and find the error. Answer keys, a tracker and a family page. Print, or type your answers. PDF.


READ NEWTON'S LAWS AT A GLANCE

My name: _____ Date _____

Read the page. Then write what you know.

1: inertia · 2: F = m × a · 3: action-reaction

Newton's three laws of motion explain how forces change the way things move. A force is a push or a pull, and every moving object, from a skateboard to a rocket, follows the same three laws.

Force
A push or a pull. A force has a size and a direction, and it is measured in newtons (N).

First law
An object at rest stays at rest, and a moving object keeps moving at the same speed in a straight line, unless an unbalanced force acts on it.

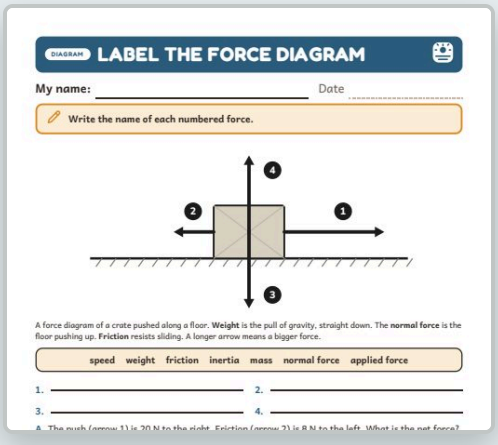
Inertia
The tendency of an object to resist a change in its motion. An object with more mass has more inertia.

Second law
Acceleration depends on the net force and the mass: F = m × a. Force is in newtons, mass in kilograms (kg) and acceleration in m/s².

Third law
When one object pushes on a second object, the second pushes back on the first with an equal force in the opposite direction. The two forces act on different objects.

Balanced and unbalanced
Balanced forces add up to a net force of zero, so the motion does not change. Unbalanced forces leave a net force, so the speed or direction changes.

Your turn. Write what you know.


DIAGRAM LABEL THE FORCE DIAGRAM

My name: _____ Date _____

Write the name of each numbered force.

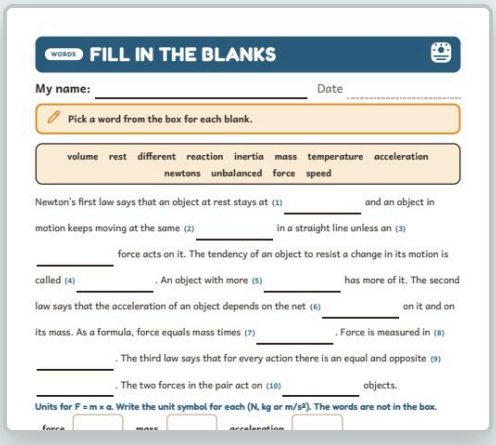
A force diagram of a crate pushed along a floor. **Weight** is the pull of gravity, straight down. The **normal force** is the floor pushing up. **Friction** resists sliding. A longer arrow means a bigger force.

speed weight friction inertia mass normal force applied force

1. _____ 2. _____

3. _____ 4. _____

A. The push (arrow 1) is 20 N to the right. Friction (arrow 2) is 8 N to the left. What is the net force?


WORDS FILL IN THE BLANKS

My name: _____ Date _____

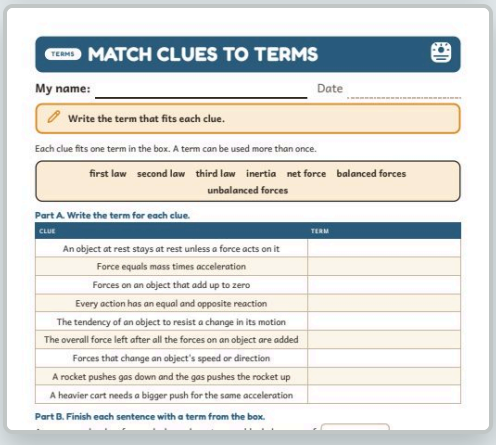
Pick a word from the box for each blank.

volume rest different reaction inertia mass temperature acceleration newtons unbalanced force speed

Newton's first law says that an object at rest stays at (1) _____ and an object in motion keeps moving at the same (2) _____ in a straight line unless an (3) _____ force acts on it. The tendency of an object to resist a change in its motion is called (4) _____. An object with more (5) _____ has more of it. The second law says that the acceleration of an object depends on the net (6) _____ on it and on its mass. As a formula, force equals mass times (7) _____. Force is measured in (8) _____. The third law says that for every action there is an equal and opposite (9) _____. The two forces in the pair act on (10) _____ objects.

Units for F = m × a. Write the unit symbol for each (N, kg or m/s²). The words are not in the box.

force _____ mass _____ acceleration _____


TERMS MATCH CLUES TO TERMS

My name: _____ Date _____

Write the term that fits each clue.

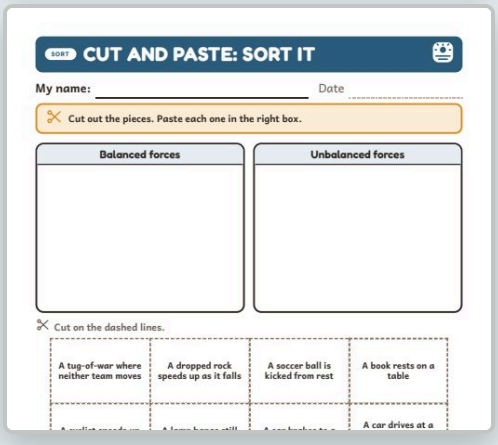
Each clue fits one term in the box. A term can be used more than once.

first law second law third law inertia net force balanced forces unbalanced forces

Part A. Write the term for each clue.

CLUE	TERM
An object at rest stays at rest unless a force acts on it	
Force equals mass times acceleration	
Forces on an object that add up to zero	
Every action has an equal and opposite reaction	
The tendency of an object to resist a change in its motion	
The overall force left after all the forces on an object are added	
Forces that change an object's speed or direction	
A rocket pushes gas down and the gas pushes the rocket up	
A heavier cart needs a bigger push for the same acceleration	

Part B. Finish each sentence with a term from the box.


SORT CUT AND PASTE: SORT IT

My name: _____ Date _____

Cut out the pieces. Paste each one in the right box.

Balanced forces	Unbalanced forces

Cut on the dashed lines.

A tug-of-war where neither team moves	A dropped rock speeds up as it falls	A soccer ball is kicked from rest	A book rests on a table
A cyclist speeds up	A lamp keeps still	A car brakes to a	A car drives at a


TRACKER NEWTON'S LAWS TRACKER

STUDENT _____ TEACHER _____ UNIT DATES _____

PAGE	PAGE TYPE	ITEMS	RIGHT	DATE	NOTES
5	Label the Force Diagram	4			
6	Fill In the Blanks	13			
7	Match Clues to Terms	14			
8	Multiple Choice	8			
9	True or False? Fix It	8			
10	Read the Data, Draw the Graph	6			
11	Solve the Force Problems	6			
12	Cut and Paste: Sort It	8			
13	Short Answers	5			
14	Explain It, Find the Error	3			

25 Pages | **11 Page Types** | **75 Items** | **2 Answer Keys**

BRIGHT PATH SPED

START HERE

QUICK START

One complete kit for a Newton's laws of motion unit in grades 6-8. Students read a reference page, label a force diagram, fill in a passage, match clues to terms, answer questions, read data and draw a graph, solve force problems and write short answers — on pages with room to work.

THREE STEPS

1. **Teach or review with the reference page**
   Page 4 has force, the three laws, inertia and balanced and unbalanced forces, and a place for the student to write what they know. Read it together or hand it out as the first page.

2. **Hand over a page**
   Every student page opens with a name line and one short instruction. Nothing on it is written for you, so the student can start. Short answers have three or more lines and the explanations have five or six, so the page is the whole workspace.

3. **Check it, record it, send it home**
   The answer keys are pages 15 and 16. Record each page on the tracker (page 17), roll a group up on page 18, and send the family page (20). A filled example is on page 21.

WHICH PAGE, WHEN

WHEN…	USE…
Introducing or reviewing the unit	At a Glance, page 4 · Label the Force Diagram, page 5
Checking the vocabulary	Fill In the Blanks, page 6 · Multiple Choice, page 8
Connecting clues to terms	Match Clues to Terms, page 7
Quick check or exit slip	True or False? Fix It, page 9
Reading data and graphing	Read the Data, Draw the Graph, page 10 · Solve the Force Problems, page 11
Hands-on sorting	Cut and Paste, balanced or unbalanced, page 12
Writing about science	Short Answers, page 13 · Explain It, Find the Error, page 14

Everything inside (25 pages)

- **11 student pages** in 11 page types: a reference page, a force diagram to label, fill in, match clues to terms, multiple choice, true or false, data and graph, F = m × a problems, cut and paste and two short-answer pages
- **75 scored items** on 10 pages
- **8 cut-and-paste pieces** on one sort mat
- **2 answer keys, 1 tracker, 1 class grid**, 1 team note, 1 family page, 1 filled example, 1 phrase bank, 1 binder cover and 6 divider tabs

Print or type

Every page prints clean in black and white. The name line, answer boxes, blanks and writing lines are type-in fields in any PDF reader: click one, type, then save. This is a fillable PDF, not a slideshow or a word-processor file. The graph and the cut-and-paste sort are for pencil and scissors.

READ NEWTON'S LAWS AT A GLANCE

My name: _____ Date .....

Read the page. Then write what you know.

1: inertia · 2: F = m × a · 3: action–reaction

Newton's three laws of motion explain how forces change the way things move. A force is a push or a pull, and every moving object, from a skateboard to a rocket, follows the same three laws.

Force

A push or a pull. A force has a size and a direction, and it is measured in newtons (N).

First law

An object at rest stays at rest, and a moving object keeps moving at the same speed in a straight line, unless an unbalanced force acts on it.

Inertia

The tendency of an object to resist a change in its motion. An object with more mass has more inertia.

Second law

Acceleration depends on the net force and the mass: F = m × a. Force is in newtons, mass in kilograms (kg) and acceleration in m/s^2.

Third law

When one object pushes on a second object, the second pushes back on the first with an equal force in the opposite direction. The two forces act on different objects.

Balanced and unbalanced

Balanced forces add up to a net force of zero, so the motion does not change. Unbalanced forces leave a net force, so the speed or direction changes.

Your turn. Write what you know.

A force is

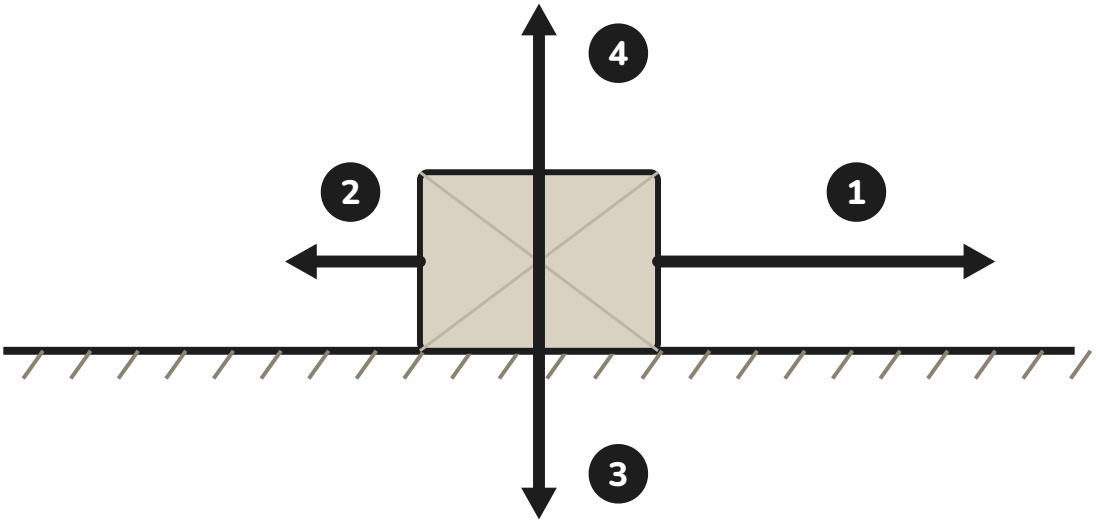
One question I still have about forces and motion

DIAGRAM

LABEL THE FORCE DIAGRAM

My name: _____ Date .....

Write the name of each numbered force.



A force diagram of a crate pushed along a floor. **Weight** is the pull of gravity, straight down. The **normal force** is the floor pushing up. **Friction** resists sliding. A longer arrow means a bigger force.

speed **weight** **friction** **inertia** **mass** **normal force** **applied force**

1. _____ **2.** _____

3. _____ **4.** _____

A. The push (arrow 1) is 20 N to the right. Friction (arrow 2) is 8 N to the left. What is the net force? Write the size and the direction.

_____

B. Arrows 3 and 4 are the same length and point in opposite directions. What does that tell you about the crate's motion up and down?

WORDS FILL IN THE BLANKS

My name: _____ Date .....

Pick a word from the box for each blank.

volume	**rest**	**different**	**reaction**	**inertia**	**mass**	**temperature**	**acceleration**
newtons	**unbalanced**	**force**	**speed**				

Newton's first law says that an object at rest stays at (1) _____ and an object in motion keeps moving at the same (2) _____ in a straight line unless an (3) _____ force acts on it. The tendency of an object to resist a change in its motion is called (4) _____. An object with more (5) _____ has more of it. The second law says that the acceleration of an object depends on the net (6) _____ on it and on its mass. As a formula, force equals mass times (7) _____. Force is measured in (8) _____. The third law says that for every action there is an equal and opposite (9) _____. The two forces in the pair act on (10) _____ objects.

Units for F = m × a. Write the unit symbol for each (N, kg or m/s²). The words are not in the box.

force ☐ **mass** ☐ **acceleration** ☐

A. Choose one word from the box that you did not use. Write what it means, or tell why it does not fit the passage.

TERMS MATCH CLUES TO TERMS

My name: _____ Date .....

Write the term that fits each clue.

Each clue fits one term in the box. A term can be used more than once.

first law **second law** **third law** **inertia** **net force** **balanced forces** **unbalanced forces**

Part A. Write the term for each clue.

CLUE	TERM
An object at rest stays at rest unless a force acts on it	
Force equals mass times acceleration	
Forces on an object that add up to zero	
Every action has an equal and opposite reaction	
The tendency of an object to resist a change in its motion	
The overall force left after all the forces on an object are added	
Forces that change an object's speed or direction	
A rocket pushes gas down and the gas pushes the rocket up	
A heavier cart needs a bigger push for the same acceleration	

Part B. Finish each sentence with a term from the box.

A passenger lurches forward when a bus stops suddenly because of _____.

A swimmer pushes the water back and the water pushes the swimmer forward. This is Newton's _____.

To find the acceleration of a cart from its mass and the force on it, use Newton's _____.

A cart gets 10 N to the right and 4 N to the left. The _____ is 6 N to the right.

Part C. Explain the difference between balanced and unbalanced forces.

SORT CUT AND PASTE: SORT IT

My name: _____ Date .....

Cut out the pieces. Paste each one in the right box.

Balanced forces	Unbalanced forces

Cut on the dashed lines.

A tug-of-war where neither team moves	A dropped rock speeds up as it falls	A soccer ball is kicked from rest	A book rests on a table
A cyclist speeds up leaving a stop sign	A lamp hangs still from the ceiling	A car brakes to a stop	A car drives at a steady speed in a straight line

1. Pick one piece you pasted in the unbalanced box. Name the force that changes its motion and tell how.

TRACKER

NEWTON'S LAWS TRACKER

STUDENT

TEACHER

UNIT DATES

PAGE	PAGE TYPE	ITEMS	RIGHT	DATE	NOTES
5	Label the Force Diagram	4			
6	Fill In the Blanks	13			
7	Match Clues to Terms	14			
8	Multiple Choice	8			
9	True or False? Fix It	8			
10	Read the Data, Draw the Graph	6			
11	Solve the Force Problems	6			
12	Cut and Paste: Sort It	8			
13	Short Answers	5			
14	Explain It, Find the Error	3			

How to fill this in

Write how many items the student got right and the date. A written answer counts as one item when it makes every point in the key (pages 15 and 16). A blank means not tried yet, never wrong. There are 75 items on the 10 pages above; the reference page (4) is not scored. Filled example: page 21.

STANDARD OR UNIT GOAL (YOUR OWN WORDING)

EXAMPLE JORDAN'S TRACKER

Jordan T. is invented; nothing on this page describes a real student. The blank tracker is on page 17.

STUDENT	TEACHER	UNIT DATES
Jordan T. (an invented student)	**Ms. Reyes (invented)**	**October**

PAGE	PAGE TYPE	ITEMS	RIGHT	DATE	NOTES
5	Label the Force Diagram	4	3	10/12	Mixed up two arrows
6	Fill In the Blanks	13	11	10/13	Missed the units
7	Match Clues to Terms	14	14	10/14	–
8	Multiple Choice	8	7	10/15	Missed number 3
9	True or False? Fix It	8	8	10/16	–
10	Read the Data, Draw the Graph	6	–	–	–
11	Solve the Force Problems	6	–	–	–
12	Cut and Paste: Sort It	8	7	10/19	One piece in the wrong box
13	Short Answers	5	–	–	–
14	Explain It, Find the Error	3	–	–	–

How to read it

Jordan T. has done **6 of 10** scored pages and got **50 of 55** items right. **2** pages were all right and **5** items were missed across 4 pages. Every number here comes from the table above.

The family note this tracker would produce

"This month Jordan finished 6 pages and got 50 of 55 items right. The next thing to practice is naming the forces on a diagram and sorting balanced from unbalanced forces." — every number in it is a row of the table above.

What the table points to

4 pages carry a note and each one is short of full. Pages left blank (4 of them) are not tried yet, never wrong. The two writing pages, Short Answers and Explain It, are among them, so they are the next step.

THANK YOU **BEFORE YOU GO**

THANK YOU FOR USING THIS RESOURCE

Built for the teacher whose students each need a different amount of support reading, writing and reasoning about science. If this helped, leaving feedback on TPT helps other teachers find it.

Everything inside, one more time

- **11 student pages** in 11 page types, **75 scored items**, every answer read from the same lists that draw the pages.
- **8 multiple-choice questions**, **8 true-or-false statements**, **8 cut-and-paste pieces** and **2 answer keys**.
- **1 tracker, 1 class grid, 1 team note, 1 family page, 1 filled example, 1 phrase bank** (15 starters), **1 binder cover** and divider tabs.

No real student anywhere in this file

The filled example on page 21 names "Jordan T.," an invented student used only to show how the tracker fills in. The data on page 10 is invented. No table, note or score anywhere in this resource describes a real child, and nothing here is a clinical judgment, an eligibility timeline, or a medical claim of any kind. Once you fill in a real student's name, the tracker, class grid and team note (pages 17, 18 and 19) do carry real information — keep completed pages secure the same way you would any other record.

Something missing or wrong?

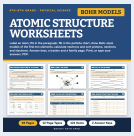
Please use the **Ask a Question** tab on the product page first — every question is read, and a fix to the file is a free update you re-download from **My Purchases**.

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More science for the same classroom.



Physical and Chemical Changes Worksheets
Sort, fill in and graph changes of matter, grades 6-8.



Atomic Structure Worksheets
Bohr models and a particle sort for a middle school atom unit, grades 6-8.



Periodic Table Worksheets
Groups, symbols, a sort and valence electrons, grades 6-8.

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