

FULL REVIEW

Full Review — Newton's Laws of Motion — Foundational

Review the essential ideas, relationships, and problem-solving tools for Newton's Laws of Motion.

 TIME 45–60 minutes	 BEST FOR A complete topic review	 FINISH WITH A readiness check
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After this full review, you'll be able to...

recall the essential ideas, apply them to representative problems, and determine what to study next.

HOW TO USE THIS GUIDE

Work through the stages in order. Write directly in the spaces provided, check your work in the Solutions section, and finish by choosing the next resource that matches your confidence.

Choose how you want to review: work through this guide, follow the online review, or watch the video review.

[Start the Review Online →](#)

[Watch the Video Review →](#)

YOU WILL NEED

Pencil or pen • Calculator if needed • Approximately 45–60 minutes

FR-02 • COURSE ALIGNMENT

Course Alignment

This Physics Sensei Topic Review is an independent learning resource. Use it to reinforce key concepts, prepare for homework, or review before a quiz or exam.

Related Unit Review: If you need to review the complete unit material, review Newton's Laws and Free-Body Diagrams here → <https://physicssensei.com/full-unit-review-newtons-laws-and-free-body-diagrams-foundational/>

RESOURCE: Physics Sensei Topic Review TOPIC ID: MEC-U05-T01 TOPIC: Newton's Laws of Motion PARENT UNIT: MEC-U05 — Newton's Laws and Free-Body Diagrams COURSE LEVEL: Foundational	BEST USED ✓ After learning the topic ✓ Before starting homework ✓ Before a quiz or exam
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FR-03 • YOUR REVIEW PLAN

Your Review Plan

Complete these six stages in order. Each stage builds on the previous one and prepares you for the final readiness check.

6 stages • Approximately 45–60 minutes

1 Warm-Up Check Activate prior knowledge.	2 Core Concepts Review the essential ideas.	3 Guided Practice Apply what you learned.
4 Confidence Check Confirm your understanding.	5 Summary Review the key ideas.	6 Next Step Continue your learning.

PRINTING TIP

For student copies, print double-sided and keep the Solutions section after the student activities so learners attempt each activity before checking their work.

FR-04 • STAGE 1 OF 6

Warm-Up Check

Before you begin, take a moment to see what you already remember. Do not worry about getting everything right. This is only a starting point.

ACTIVITY 1**Recall Activity 1**

Answer before revealing the response.

In one sentence, distinguish velocity from acceleration.

ACTIVITY 2**Recall Activity 2**

Answer before revealing the response.

True or false: an object moving to the right must have a net force to the right. Explain.

FR-04 • WARM-UP CHECK CONTINUED

ACTIVITY 3

Recall Activity 3

Answer before revealing the response.

A person pushes on a wall. Identify the interaction pair.

Ready to strengthen your understanding?

You've refreshed what you already know. Next, reinforce the essential concepts that will help you solve problems with confidence.

Continue to Core Concepts →

FR-05 • STAGE 2 OF 6

Core Concepts

Let's rebuild the key ideas one step at a time. Focus on understanding the relationships before worrying about solving problems.

KEY CONCEPT 1**Newton's First Law and Inertia**

Newton's first law says an object's velocity remains unchanged when the net external force is zero. This includes both rest and constant-velocity motion. Inertia is the tendency to resist changes in velocity.

An object keeps its velocity unless a net external force changes it.

EXAMPLE Check the net force on one chosen object before deciding how its motion changes.

SENSEI NOTE Constant velocity means zero acceleration; it does not require the object to be at rest.

KEY CONCEPT 2**Newton's Second Law: Net Force and Motion**

Newton's second law connects the combined external force to acceleration. The acceleration points in the direction of the net force. For the same mass, a larger net force produces a larger acceleration; for the same force, a larger mass produces a smaller acceleration.

Net force causes acceleration; more net force means more acceleration, while more mass means less acceleration for the same net force.

EXAMPLE Use object labels on interaction forces so third-law partners stay on different free-body diagrams.

SENSEI NOTE Do not pair weight and normal force as a third-law pair; both can act on the same object.

FR-05 • CORE CONCEPTS CONTINUED

KEY CONCEPT 3

Newton's Third Law: Interaction Pairs

Newton's third law describes interactions. If object A pushes or pulls object B, object B simultaneously pushes or pulls object A with equal strength in the opposite direction. The pair acts on different objects.

Forces between two interacting objects come in equal-magnitude, opposite-direction pairs acting on different objects.

EXAMPLE Compare force direction with acceleration or momentum-change direction.

SENSEI NOTE Equal third-law forces can produce different accelerations when masses differ.

Ready to apply these ideas?

You've reinforced the essential concepts. Now put them into practice by working through guided examples and building your problem-solving confidence.

Continue to Guided Practice →

FR-06 • STAGE 3 OF 6

Guided Practice

Now it's time to apply what you've reviewed. Work through each activity in order. The examples become gradually more challenging, and each prepares you for the final readiness check.

PRACTICE 1**Worked Example**

Follow the model solution and identify the law used.

A sled moves across nearly frictionless ice after the push ends. Describe its motion and identify which law explains it.

FR-06 • GUIDED PRACTICE CONTINUED

PRACTICE 2

Guided Problem

Use the checkpoints, then complete the calculation or explanation.

A box has a stronger rightward push than leftward friction. Predict the acceleration direction and explain how mass would affect the amount of acceleration.

PRACTICE 3

Independent Problem

Solve independently and state the Newton's-law reasoning.

A student pushes backward on the floor while walking. Identify the third-law partner force that moves the student forward.

Ready to check your understanding?

You've practiced the essential skills with guidance. Now solve a few short problems on your own and confirm you're ready to move forward.

Continue to Confidence Check →

FR-07 • STAGE 4 OF 6

Confidence Check

You've rebuilt the key ideas and practiced them with guidance. Now try these short questions on your own to check your understanding before moving on.

QUICK CHECK 1**Newton's Laws Check 1**

Solve and justify your conclusion.

An object is moving but has zero acceleration. What does that tell you about its net external force?

QUICK CHECK 2**Newton's Laws Check 2**

Solve and justify your conclusion.

Two identical pushes act in opposite directions on the same box. What is the box's acceleration?

FR-07 • CONFIDENCE CHECK CONTINUED

QUICK CHECK 3

Newton's Laws Check 3

Solve and justify your conclusion.

A truck collides with a small car. Which vehicle experiences the larger interaction force?

HOW DID IT GO?

I answered ____ of 3 questions correctly.

Use the Solutions section to check your reasoning, then take one final look at the essential ideas.

You've checked your understanding.

Take one final look at the essential ideas before deciding what to do next.

Continue to Summary →

FR-08 • STAGE 5 OF 6

Summary

Before moving on, take one final look at the most important ideas from this review.

KEY TAKEAWAY 1

Zero net force means no change in velocity.

Zero net force means no change in velocity.

KEY TAKEAWAY 2

Net external force determines acceleration or momentum change.

Net external force determines acceleration or momentum change.

KEY TAKEAWAY 3

Third-law forces are equal/opposite and act on different objects.

Third-law forces are equal/opposite and act on different objects.

MY ONE-SENTENCE SUMMARY

In my own words, the most important idea is:

Ready for your next step?

You've reviewed the essential ideas one last time. Now choose the resource that best matches how confident you feel.

Continue to Next Step →

ANSWER KEY • CHECK AFTER ATTEMPTING

Solutions and Explanations

Use these solutions to check your reasoning—not only your final answer. Replace each placeholder with a concise answer and the essential explanation.

WARM-UP • ACTIVITY 1

Recall Activity 1

Velocity describes how position changes; acceleration describes how velocity changes.

WHY IT WORKS The result follows by isolating one object and applying the net-force rule or the correct interaction pair.

WARM-UP • ACTIVITY 2

Recall Activity 2

False. Constant rightward velocity can occur with zero net force.

WHY IT WORKS The result follows by isolating one object and applying the net-force rule or the correct interaction pair.

WARM-UP • ACTIVITY 3

Recall Activity 3

Person pushes wall; wall pushes person with equal magnitude in the opposite direction.

WHY IT WORKS The result follows by isolating one object and applying the net-force rule or the correct interaction pair.

SOLUTIONS • GUIDED PRACTICE

PRACTICE 1**Worked Example**

With negligible net force, the sled continues with approximately constant velocity. This is Newton's first law.

WHY IT WORKS The result follows by isolating one object and applying the net-force rule or the correct interaction pair.

PRACTICE 2**Guided Problem**

The acceleration is to the right. A larger mass would produce less acceleration for the same net force.

WHY IT WORKS The result follows by isolating one object and applying the net-force rule or the correct interaction pair.

PRACTICE 3**Independent Problem**

The floor pushes forward on the student; that force accelerates the student forward.

WHY IT WORKS The result follows by isolating one object and applying the net-force rule or the correct interaction pair.

SOLUTIONS • CONFIDENCE CHECK

QUICK CHECK 1

Newton's Laws Check 1

The net external force is zero.

WHY IT WORKS The result follows by isolating one object and applying the net-force rule or the correct interaction pair.

QUICK CHECK 2

Newton's Laws Check 2

The net force is zero, so acceleration is zero.

WHY IT WORKS The result follows by isolating one object and applying the net-force rule or the correct interaction pair.

QUICK CHECK 3

Newton's Laws Check 3

They experience equal-magnitude interaction forces in opposite directions.

WHY IT WORKS The result follows by isolating one object and applying the net-force rule or the correct interaction pair.

READINESS GUIDE

3 correct: You're ready to continue. • 2 correct: Review the missed idea, then continue. • 0–1 correct: Revisit Core Concepts or choose more practice.

FR-09 • STAGE 6 OF 6

Next Step: Continue Learning

Great work! You've completed this review. Choose the next resource that best matches how confident you feel.

 I'm Still Unsure Review the key ideas and examples again. Review Again →	 I Need More Practice Continue with additional practice for this topic. Go to Practice →	 I'm Ready Continue to the next recommended resource. Continue →
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RECOMMENDED LINKS

[Review this topic again →](#)[Find additional practice →](#)[Choose another type of physics help →](#)

Continue reviewing with these companion resources.

[Start the Review Online →](#)[Watch the Video Review →](#)

PHYSICS HELP THAT MAKES SENSE

A Physics Sensei review never ends at the last question. It always guides you toward the next useful step.

PhysicsSensei.com