

FOCUSED REVIEW

Focused Review — Work and the Work–Energy Theorem — Foundational

Review the most important ideas, reinforce the essential skills, and confirm you're ready to move on.

 TIME 15–20 minutes	 BEST FOR Focused review	 FINISH WITH Greater confidence
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After this focused review, you'll be able to...

recognize the key concepts, reinforce your problem-solving skills, and continue with greater confidence.

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 15–20 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 [Work, Energy, and Power here →](#)

RESOURCE: Physics Sensei Topic Review
TOPIC ID: MEC-U06-T01
TOPIC: Work and the Work–Energy Theorem
PARENT UNIT: MEC-U06 — Work, Energy, and Power
COURSE LEVEL: Foundational

BEST USED

- ✓ After learning the topic
- ✓ Before starting homework
- ✓ Before a quiz or exam

FR-03 • YOUR REVIEW PLAN

Your Review Plan

Complete these six focused stages in order. Each stage reinforces your understanding and prepares you for a final confidence check.

6 stages • Approximately 15–20 minutes

1 Warm-Up Check Refresh key ideas.	2 Core Concepts Reinforce the essentials.	3 Guided Practice Strengthen key skills.
4 Confidence Check Confirm your understanding.	5 Summary Remember the essentials.	6 Next Step Choose your next step.

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 minute to reactivate what you already know. This quick warm-up will help you focus on the most important ideas before moving on.

WARM-UP 1**Key Ideas**

Answer before revealing the response.

In one sentence, describe when a force does positive work.

WARM-UP 2**Common Mistakes**

Answer before revealing the response.

A force acts on an object but the object does not move. How much work is done by that force?

FR-04 • WARM-UP CHECK CONTINUED

WARM-UP 3

Quick Application

Answer before revealing the response.

A 12 N force pushes a cart 4 m in the direction of motion. Find the work done.

Ready to strengthen your understanding?

You've refreshed the most important ideas. Now reinforce the concepts you'll use most often.

Continue to Core Concepts →

FR-05 • STAGE 2 OF 6

Core Concepts

Let's reinforce the most important concepts you'll need to solve problems with confidence. Focus on the ideas that appear most often in homework, quizzes, and exams.

KEY CONCEPT 1**Work and the Direction of Force**

Work depends on the part of a force that acts along the displacement. A force in the direction of motion does positive work; a force opposite the motion does negative work.

$$W = F d$$

EXAMPLE A 20 N forward force over 2 m does +40 J of work when it is parallel to the motion.

SENSEI NOTE A force can be present without doing work if there is no displacement in its direction.

KEY CONCEPT 2**Net Work Changes Kinetic Energy**

The total work done by all forces changes an object's kinetic energy. Positive net work increases kinetic energy; negative net work decreases it.

$$W_{net} = \Delta K$$

EXAMPLE If the net work on a cart is +15 J, its kinetic energy increases by 15 J.

SENSEI NOTE The work–energy theorem uses net work, not the work of only one selected force.

Ready to apply these ideas?

You've reinforced the essential concepts. Now strengthen your problem-solving skills by working through a few guided examples.

Continue to Guided Practice →

FR-06 • STAGE 3 OF 6

Guided Practice

Now apply the key concepts you've just reviewed. Work through these focused practice activities to reinforce your problem-solving skills before the final confidence check.

PRACTICE 1**Guided Example**

Use the force and displacement to calculate the work, then interpret its sign.

A 15 N horizontal push moves a crate 5 m forward. Show the calculation and state whether the work adds or removes energy.

PRACTICE 2**Independent Check**

Use the work–energy theorem to determine the change in kinetic energy.

The net work on a cart is -24 J. If its initial kinetic energy is 60 J, find its final kinetic energy.

Ready for a confidence check?

You've reinforced the essential skills through focused practice. Now confirm your understanding with two short questions.

Continue to Confidence Check →

FR-07 • STAGE 4 OF 6

Confidence Check

You've reinforced the key concepts and practiced the essential skills. Now confirm you're ready to move forward by completing these short confidence checks.

CONFIDENCE CHECK 1

Sign of Work

Solve independently before checking the solution.

A braking force acts opposite a car's displacement. Is the work by the braking force positive, negative, or zero?

CONFIDENCE CHECK 2

Kinetic-Energy Change

Solve independently before checking the solution.

A moving object has 40 J of kinetic energy. The net work on it is +25 J. What is its final kinetic energy?

HOW DID IT GO?

I answered ____ of 2 questions correctly.

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

You've confirmed your understanding.

Take one final look at the essential ideas before choosing your next step.

Continue to Summary →

FR-08 • STAGE 5 OF 6

Summary

Before moving on, take one final look at the essential ideas you'll want to remember.

KEY TAKEAWAY 1**Work Has a Sign**

The sign of work tells whether a force adds energy to or removes energy from the object.

KEY TAKEAWAY 2**Net Work Tracks Kinetic Energy**

Net work equals the change in kinetic energy, so it connects forces and motion through energy.

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

Key Ideas

Positive work occurs when the force has a component in the direction of displacement.

WHY IT WORKS A force component along displacement transfers energy to the object.

WARM-UP • ACTIVITY 2

Common Mistakes

0 J. Without displacement, this force transfers no energy by work.

WHY IT WORKS Work requires displacement through the force's line of action.

WARM-UP • ACTIVITY 3

Quick Application

48 J. For a parallel force, work is force times displacement: $12 \times 4 = 48$ J.

WHY IT WORKS Parallel force and displacement make the work equal to force times distance.

SOLUTIONS • GUIDED PRACTICE

PRACTICE 1**Guided Example**

75 J, positive. The push transfers 75 J of energy to the crate.

WHY IT WORKS The applied force is parallel to the displacement, so the work is positive.

PRACTICE 2**Independent Check**

36 J. The kinetic energy changes by -24 J: $60 \text{ J} - 24 \text{ J} = 36 \text{ J}$.

WHY IT WORKS Net work equals the change in kinetic energy.

SOLUTIONS • CONFIDENCE CHECK

CONFIDENCE CHECK 1

Sign of Work

Negative. The braking force points opposite the displacement.

WHY IT WORKS Opposite force and displacement give negative work.

CONFIDENCE CHECK 2

Kinetic-Energy Change

65 J. The object gains 25 J of kinetic energy.

WHY IT WORKS Positive net work increases kinetic energy by the same amount.

READINESS GUIDE

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

FR-09 • STAGE 6 OF 6

Next Step: Continue Learning

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

? I'm Still Unsure Review the focused review again to strengthen the essential concepts. Review Again →	🎯 I Need More Practice Build confidence with additional practice problems. Go to Practice →	✓ I'm Ready Continue to the next topic or learning 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