

FOCUSED REVIEW

Focused Review: Phase Changes and Latent Heat

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

RESOURCE: Physics Sensei Unit Review
UNIT ID: THM-U04
TOPIC: Phase Changes and Latent Heat
COURSE LEVEL: Foundational introductory physics

BEST USED

- ✓ After learning the unit
- ✓ 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**

Recall the phase-change names.

Name the changes solid→liquid, liquid→gas, and gas→liquid.

WARM-UP 2**Common Mistakes**

Connect energy direction to phase change.

Which absorbs energy: melting or freezing? Which releases energy?

FR-04 • WARM-UP CHECK CONTINUED

WARM-UP 3

Quick Application

Recognize a phase-change plateau.

On a heating curve, what does a flat segment usually represent?

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

Phase Changes and Latent Heat

During a phase change, energy can be transferred while temperature stays nearly constant. Latent heat is the energy per unit mass associated with the transition.

$$Q = mL$$

EXAMPLE Melting ice at 0 °C requires energy even though its temperature stays near 0 °C.

SENSEI NOTE Do not use $Q = mc\Delta T$ during the phase-change plateau.

KEY CONCEPT 2

Heating Curves and Multistage Energy

Sloped heating-curve segments correspond to temperature changes; flat segments correspond to phase changes. For a multistage process, calculate each stage separately and add the energies.

$$\text{Temperature change: } Q = mc\Delta T; \text{ phase change: } Q = mL$$

EXAMPLE Warm solid → melt → warm liquid is a three-stage process.

SENSEI NOTE Write the stages before inserting numbers.

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 $Q = mL$ and keep units consistent.

Find the energy needed to melt 0.10 kg of ice when $L_f = 334 \text{ kJ/kg}$.

PRACTICE 2**Independent Check**

Solve a phase-change energy question independently.

Find the magnitude of energy released when 0.020 kg of water vapor condenses when $L_v = 2260 \text{ kJ/kg}$.

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

Constant Temperature

Explain briefly.

Why does temperature remain nearly constant while a pure substance melts at fixed pressure?

CONFIDENCE CHECK 2

Choose the Model

State the formula and latent heat.

What relationship is used to calculate the energy for liquid→gas at the boiling point?

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**Phase change $\neq$ temperature change**

A substance can absorb or release energy while changing phase at nearly constant temperature.

KEY TAKEAWAY 2**Use $Q = mL$ during the transition**

Choose the latent heat that matches the phase change and account for whether energy is absorbed or released.

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

Melting, vaporization, and condensation.

WHY IT WORKS Correct phase names help you choose the right energy model.

WARM-UP • ACTIVITY 2

Common Mistakes

Melting absorbs energy; freezing releases energy.

WHY IT WORKS Moving to a less bound phase requires energy; the reverse releases it.

WARM-UP • ACTIVITY 3

Quick Application

A phase change occurring at nearly constant temperature.

WHY IT WORKS Energy goes into changing phase rather than raising temperature during the plateau.

SOLUTIONS • GUIDED PRACTICE

PRACTICE 1

Guided Example

$$Q = (0.10)(334) = 33.4 \text{ kJ absorbed.}$$

WHY IT WORKS Melting is a solid→liquid phase change, so use L_f .

PRACTICE 2

Independent Check

$$Q = (0.020)(2260) = 45.2 \text{ kJ released.}$$

WHY IT WORKS Condensation is the reverse of vaporization, so the magnitude is mL_v and the energy leaves the substance.

SOLUTIONS • CONFIDENCE CHECK

CONFIDENCE CHECK 1

Constant Temperature

The transferred energy changes the phase arrangement rather than increasing average kinetic energy.

WHY IT WORKS That energy is latent heat.

CONFIDENCE CHECK 2

Choose the Model

Use $Q = mL_v$.

WHY IT WORKS Liquid ↔ gas transitions use the latent heat of vaporization.

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