

FOCUSED REVIEW

Focused Review: Units and Measurements — Algebra-Based

Review the highest-leverage measurement 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...

perform multistep conversions, use scientific notation and significant figures, evaluate dimensions, and calculate uncertainty.

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: MEC-U01 TOPIC: Units and Measurements COURSE LEVEL: Algebra-based introductory college physics	BEST USED ✓ After learning the unit ✓ Before starting homework ✓ Before a quiz or exam
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[Start the Unit Review Online →](#)

Physics Sensei organizes this material as an independent learning unit rather than following an external textbook chapter sequence.

Physics Sensei • MEC-U01 Focused Review • Units and Measurements • Algebra Based

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 — page 4 Refresh key ideas.	2 Core Concepts — page 6 Reinforce the essentials.	3 Guided Practice — page 7 Strengthen key skills.
4 Confidence Check — page 8 Confirm your understanding.	5 Summary — page 10 Remember the essentials.	6 Next Step — page 14 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 SI units and metric powers.

Write 2500 micrometers in meters using scientific notation.

WARM-UP 2

Common Mistakes

Square the full conversion factor for area.

Convert 1.20 m^2 to cm^2 .

FR-04 • WARM-UP CHECK CONTINUED

WARM-UP 3

Quick Application

Use dimensions as an equation check.

Is $v = x/t$ dimensionally consistent for velocity?

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 — page 6 →

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**Conversion Chains and Scientific Notation**

Write every conversion as multiplication by a ratio equal to one. Arrange the ratio so the unwanted unit cancels. Scientific notation keeps powers of ten explicit and helps preserve significant figures through long conversion chains.

$$72 \text{ km/h} \times (1000 \text{ m} / 1 \text{ km}) \times (1 \text{ h} / 3600 \text{ s}) = 20 \text{ m/s.}$$

EXAMPLE 5.40×10^5 micrometers $\times (10^{-6} \text{ m} / 1 \text{ micrometer}) = 0.540 \text{ m}$.

SENSEI NOTE For squared or cubed units, the numerical conversion factor must also be squared or cubed.

KEY CONCEPT 2**Dimensional Analysis, Significant Figures, and Uncertainty**

Dimensional analysis tests whether an equation has compatible quantity types. Significant figures constrain how precisely a calculated result should be reported, while relative or percent uncertainty compares uncertainty with the measured value.

$$[v] = \text{L T}^{-1}; [a] = \text{L T}^{-2}; [\rho] = \text{M L}^{-3}; \text{percent uncertainty} = (\Delta x / x) \times 100\%.$$

EXAMPLE For $18.4 \pm 0.3 \text{ cm}$, percent uncertainty $= (0.3/18.4) \times 100\% = 1.6\%$.

SENSEI NOTE A dimensionally correct equation can still be numerically or physically wrong; use dimensions as a filter, not a proof.

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 — page 7 →

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**

Convert speed using two factors.

Convert 55.0 mi/h to m/s using $1 \text{ mi} = 1609 \text{ m}$.

PRACTICE 2**Independent Check**

Use density units consistently.

A material has density 7.85 g/cm^3 . Convert it to kg/m^3 .

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 — page 8 →

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**Dimensional Check**

Compare the dimensions before substituting numbers.

Does $x = vt + (1/2)at^2$ have dimensions of length?

CONFIDENCE CHECK 2**Significant Figures**

Apply the multiplication rule only at the end.

Evaluate 12.4×3.6 and report the appropriate significant figures.

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 — page 10 →

FR-08 • STAGE 5 OF 6**Summary**

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

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KEY TAKEAWAY 1**Cancellation Controls Conversion**

A good conversion setup leaves only the desired units before arithmetic begins.

KEY TAKEAWAY 2**Dimensions and Precision Are Independent Checks**

Dimensions test quantity structure; significant figures and uncertainty test justified numerical precision.

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 — page 14 →

ANSWER KEY • CHECK AFTER ATTEMPTING

Solutions and Explanations

Use these solutions to check your reasoning—not only your final answer. Use each answer and explanation to check both the setup and the physical interpretation.

WARM-UP • ACTIVITY 1**Key Ideas**

2500 micrometers = 2.5×10^{-3} m if the written 2500 has two significant figures.

WHY IT WORKS micro = 10^{-6} , so 2500×10^{-6} m = 2.5×10^{-3} m.

WARM-UP • ACTIVITY 2

Common Mistakes

$$1.20 \text{ m}^2 = 1.20 \times 10^4 \text{ cm}^2.$$

WHY IT WORKS $(100 \text{ cm}/1 \text{ m})^2 = 10^4 \text{ cm}^2/\text{m}^2$.

WARM-UP • ACTIVITY 3**Quick Application**

Yes.

WHY IT WORKS x/t has dimensions L/T , the dimensions of velocity.

SOLUTIONS • GUIDED PRACTICE**PRACTICE 1****Guided Example**

$$55.0 \text{ mi/h} = 24.6 \text{ m/s}.$$

WHY IT WORKS Multiply by $1609 \text{ m}/1 \text{ mi}$ and $1 \text{ h}/3600 \text{ s}$; the remaining unit is m/s .

PRACTICE 2**Independent Check**

$$7.85 \text{ g/cm}^3 = 7.85 \times 10^3 \text{ kg/m}^3.$$

WHY IT WORKS $1 \text{ g/cm}^3 = 1000 \text{ kg/m}^3$.

SOLUTIONS • CONFIDENCE CHECK**CONFIDENCE CHECK 1****Dimensional Check**

Yes.

WHY IT WORKS vt has dimensions $(L/T)T = L$ and at^2 has dimensions $(L/T^2)T^2 = L$.

CONFIDENCE CHECK 2

Significant Figures

$12.4 \times 3.6 = 45$ to two significant figures.

WHY IT WORKS The factor 3.6 has only two significant figures, so it limits the reported product.

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: return to Warm-Up Check on page 4.	🎯 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 again: return to Warm-Up Check on page 4.

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