

FOCUSED REVIEW

Focused Review — Significant Figures and Measurement Uncertainty — 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 [Units and Measurements here →](#)

RESOURCE: Physics Sensei Topic Review
TOPIC ID: MEC-U01-T02
TOPIC: Significant Figures and Measurement
Uncertainty
PARENT UNIT: MEC-U01 — Units and Measurements
COURSE LEVEL: Foundational College Physics

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.

Which value communicates greater precision: 8.2 cm or 8.20 cm? Explain briefly.

WARM-UP 2**Common Mistakes**

Answer before revealing the response.

Identify the digits that are significant in 0.03040 s.

FR-04 • WARM-UP CHECK CONTINUED

WARM-UP 3

Quick Application

Answer before revealing the response.

A ruler measurement is reported as 15.6 cm. What does the last reported digit tell you about the measurement?

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

Reading Significant Figures

Significant figures communicate which digits are supported by the measurement. Leading zeros are not significant; zeros between significant digits are; trailing zeros after a decimal point are significant. Exact counts and defined conversion factors are not limited by significant figures.

Number of significant figures = all certain digits + one estimated digit

EXAMPLE 0.03040 s has four significant figures: 3, 0, 4, and the final 0.

SENSEI NOTE First decide whether each zero is a placeholder or a measured digit.

KEY CONCEPT 2

Reporting Measurement Uncertainty

No physical measurement is infinitely precise. The reported digits and the uncertainty should agree about the measurement resolution. When comparing two measurements, consider whether their uncertainty ranges overlap before claiming they are different.

Measured value = best estimate $\pm$ uncertainty

EXAMPLE A length reported as 25.3 ± 0.1 cm represents values consistent with the measurement near 25.3 cm within about one tenth of a centimeter.

SENSEI NOTE Extra calculator digits do not create extra experimental precision.

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**

Count and Interpret

For each value, state the number of significant figures and identify why: 0.00560 m; 7.030 s; 1200 kg with no decimal point.

PRACTICE 2**Independent Check**

Report a Measurement

A digital balance reads 42.37 g and its resolution is 0.01 g. Write a reasonable measurement statement using the displayed resolution.

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

Significant or Placeholder?

Choose the significant digits.

How many significant figures are in 0.07050?

CONFIDENCE CHECK 2

Match Precision

Choose the better report.

Which better matches an uncertainty of ± 0.2 cm: 18.346 cm or 18.3 cm?

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**Digits Carry Information**

Significant figures are a compact way to show the precision justified by a measured value.

KEY TAKEAWAY 2**Uncertainty Sets the Limit**

Report a measurement only to a place value consistent with its uncertainty; calculator digits beyond that are not experimentally meaningful.

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

8.20 cm communicates greater precision because the trailing zero shows resolution to the hundredth of a centimeter.

WHY IT WORKS Trailing decimal zeros can be measured digits, not placeholders.

WARM-UP • ACTIVITY 2

Common Mistakes

0.03040 s has four significant figures: 3, the interior 0, 4, and the trailing 0.

WHY IT WORKS Leading zeros locate the decimal point; interior and trailing decimal zeros can carry measurement information.

WARM-UP • ACTIVITY 3

Quick Application

The last digit is the least precise reported digit; it indicates the measurement was resolved to about the tenths place.

WHY IT WORKS The final reported digit communicates the scale of the measurement resolution.

SOLUTIONS • GUIDED PRACTICE

PRACTICE 1**Guided Example**

0.00560 m has 3 significant figures; 7.030 s has 4; 1200 kg is ambiguous without additional notation, so scientific notation should be used to show intended precision.

WHY IT WORKS The result follows the reporting rule emphasized in the corresponding practice item.

PRACTICE 2**Independent Check**

A reasonable report is 42.37 ± 0.01 g if the instrument specification supports using one display unit as the uncertainty estimate.

WHY IT WORKS The result follows the reporting rule emphasized in the corresponding practice item.

SOLUTIONS • CONFIDENCE CHECK

CONFIDENCE CHECK 1

Significant or Placeholder?

4: 7, 0, 5, and the final 0 are significant.

WHY IT WORKS This check tests whether the stated precision matches the measurement or calculation rule being used.

CONFIDENCE CHECK 2

Match Precision

18.3 cm. Reporting thousandths would imply precision not supported by an uncertainty of two tenths.

WHY IT WORKS This check tests whether the stated precision matches the measurement or calculation rule being used.

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