

## QUICK REVIEW

# Quick Review — Relative Velocity in Two Dimensions — Foundational

Refresh the most important ideas, formulas, and problem-solving strategies for Relative Velocity in Two Dimensions in just a few minutes.

|                                                                                                                  |                                                                                                                         |                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <br><b>TIME</b><br>5–10 minutes | <br><b>BEST FOR</b><br>A rapid refresh | <br><b>FINISH WITH</b><br>Key ideas refreshed |
|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|

**After this quick review, you'll be able to...**

quickly recall the essential concepts, formulas, and problem-solving strategies needed to move forward with confidence.

**HOW TO USE THIS GUIDE**

Work through the four stages in order. Write directly in the spaces provided, check your work in the Quick Answers 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 5–10 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 [Motion in Two Dimensions here](#)



|                                                                                                                                                                                               |                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| RESOURCE: Physics Sensei Topic Review<br>TOPIC ID: MEC-U04-T02<br>TOPIC: Relative Velocity in Two Dimensions<br>PARENT UNIT: MEC-U04 — Motion in Two Dimensions<br>COURSE LEVEL: Foundational | BEST USED<br>✓ After learning the topic<br>✓ Before starting homework<br>✓ Before a quiz or exam |
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**BEST USED**

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

## FR-03 • YOUR REVIEW PLAN

# Your Review Plan

Complete these four stages to quickly refresh the essential ideas and confirm you're ready to continue.

4 stages • Approximately 5–10 minutes

|                                                                                        |                                                                                        |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <p><b>1</b></p> <p><b>Quick Recall</b></p> <p>Refresh what you already know.</p>       | <p><b>2</b></p> <p><b>Essential Idea</b></p> <p>Review the most important concept.</p> |
| <p><b>3</b></p> <p><b>Confidence Check</b></p> <p>Confirm you're ready to move on.</p> | <p><b>4</b></p> <p><b>Next Step</b></p> <p>Continue your learning.</p>                 |

**PRINTING TIP**

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

FR-04 • STAGE 1 OF 4

## Quick Recall

Let's quickly refresh what you already know. This short recall activity will bring the most important ideas back to mind before you review them.

### QUICK RECALL

#### Recall Activity

A boat moves east relative to water while the water flows north relative to shore. Which two motions must be combined to describe the boat from shore?

#### Ready to refresh the essentials?

Great! Now review the most important idea you'll want to remember.

[Review the Essential Idea →](#)

## FR-05 • STAGE 2 OF 4

## Essential Idea

Take one last look at the most important concept from this topic. If you remember this idea, the rest will come back much more easily.

**ESSENTIAL IDEA**

Velocity depends on the observer

Name the object, then the observer. To describe A as seen by B, combine A's motion relative to the ground with the opposite of B's motion relative to the ground. Draw both directions before combining them.

$$\vec{v}_{A/B} = \vec{v}_{A/G} - \vec{v}_{B/G}$$

**EXAMPLE** A boat moves north through water that flows east. A person on shore sees the boat move northeast.

**SENSEI NOTE** "A relative to B" and "B relative to A" point in opposite directions.

**Ready to check your memory?**

You've refreshed the essential idea. Now see how much you remember before moving on.

**Start the Confidence Check** →

FR-06 • STAGE 3 OF 4

## Confidence Check

You've refreshed the essential idea. Now answer this quick confidence check to confirm you're ready to move on.

**CONFIDENCE CHECK****Relative motion**

Use the common ground frame.

Two people walk east at the same speed. What velocity does one see for the other?

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**Ready for your next step?**

Great work! You've refreshed the essential idea. Now choose the resource that best matches what you'd like to do next.

**Choose Your Next Step →**

## QUICK ANSWERS • CHECK AFTER ATTEMPTING

## Quick Answers and Explanations

Use these concise answers to check your recall and confidence—not only your final response.

**QUICK RECALL****Recall Activity**

Combine the boat's eastward velocity relative to water with the water's northward velocity relative to shore.

**WHY IT WORKS** Naming the intermediate observer keeps the velocity relation consistent.

**CONFIDENCE CHECK****CONFIDENCE CHECK**

Relative motion

Zero. Their shared eastward motion cancels when one is used as the observer.

**WHY IT WORKS** The signed vector difference uses the same ground frame.

**READINESS GUIDE**

1 correct: You're ready to continue. • 0 correct: Revisit the Essential Idea or choose more practice.

FR-07 • STAGE 4 OF 4

## Next Step: Continue Learning

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

|                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;">?</p> <p style="text-align: center;"><b>I'm Still Unsure</b></p> <p style="text-align: center;">Review the essential idea again.</p> <p style="text-align: center;"><b>Review Again →</b></p> | <p style="text-align: center;">⊙</p> <p style="text-align: center;"><b>I Need More Practice</b></p> <p style="text-align: center;">Continue with additional practice for this topic.</p> <p style="text-align: center;"><b>Go to Practice →</b></p> | <p style="text-align: center;">✓</p> <p style="text-align: center;"><b>I'm Ready</b></p> <p style="text-align: center;">Continue to the next recommended resource.</p> <p style="text-align: center;"><b>Continue →</b></p> |
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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**