

FOCUSED REVIEW

Focused Review: Electric Fields — 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 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: EME-U02
TOPIC: Electric Fields
COURSE LEVEL: Foundational

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 direction rule for electric fields.

For a positive source charge, which way does the electric field point? For a negative source charge?

WARM-UP 2**Common Mistakes**

Distinguish the electric field from the force on a test charge.

A negative test charge is placed in an existing field. Does the electric field reverse, or only the force direction?

FR-04 • WARM-UP CHECK CONTINUED

WARM-UP 3

Quick Application

Use inverse-square proportional reasoning.

If the distance from the same point charge doubles, how does the electric-field magnitude change?

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

Electric Field Meaning and Direction

An electric field describes how a source-charge arrangement affects space. At each point, the field points in the direction a positive test charge would be pushed. Positive source charges produce outward fields; negative source charges produce inward fields.

$$E = k|Q|/r^2; \quad E_{\text{net}} = \sum_i E_i$$

EXAMPLE At a point to the right of a negative source charge, the electric field points left, toward the charge.

SENSEI NOTE Do not confuse the field with the force on a particular test charge.

KEY CONCEPT 2

Field Strength and Field Lines

$$E = k|Q|/r^2; \quad E_{\text{net}} = \sum_i E_i$$

$$E = k|Q|/r^2; \quad E_{\text{net}} = \sum_i E_i$$

EXAMPLE At twice the distance from the same point charge, the field magnitude is one-fourth as large.

SENSEI NOTE Field lines are a visualization of the field, not paths that charges must follow.

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 field direction to predict force direction.

At point P the electric field points left. What is the force direction on a positive test charge? On a negative test charge?

PRACTICE 2**Independent Check**

Use symmetry before doing any calculation.

Two identical positive charges are equally far from a midpoint. Determine the net electric field at the midpoint and explain.

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

Direction Near a Negative Charge

State the field direction.

Point P is to the right of a negative source charge. Which way does the electric field point?

CONFIDENCE CHECK 2

Force on a Negative Charge

Use the sign of the test charge.

The electric field points upward. Which way is the force on a negative charge?

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

Electric Field Meaning and Direction

An electric field describes how a source-charge arrangement affects space. At each point, the field points in the direction a positive test charge would be pushed. Positive source charges produce outward fields; negative source charges produce inward fields.

KEY TAKEAWAY 2

Field Strength and Field Lines

$$E = k|Q|/r^2; \quad E_{\text{net}} = \sum_i E_i$$

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: outward. Negative: inward.

WHY IT WORKS Use the defining direction rule for the electric field.

WARM-UP • ACTIVITY 2

Common Mistakes

The electric field does not reverse. The force on the negative test charge points opposite the field.

WHY IT WORKS Keep electric field distinct from force on a test charge.

WARM-UP • ACTIVITY 3

Quick Application

It becomes one-fourth as large because E is proportional to $1/r^2$.

WHY IT WORKS Apply the treatment-appropriate field relationship.

SOLUTIONS • GUIDED PRACTICE

PRACTICE 1**Guided Example**

Positive: left. Negative: right.

WHY IT WORKS The field direction is defined for a positive test charge; a negative charge experiences force opposite the field.

PRACTICE 2**Independent Check**

The net field is zero.

WHY IT WORKS The two field vectors have equal magnitude and opposite directions, so they cancel.

SOLUTIONS • CONFIDENCE CHECK

CONFIDENCE CHECK 1

Direction Near a Negative Charge

Left, toward the negative charge.

WHY IT WORKS Apply the relevant electric-field relationship and direction rule.

CONFIDENCE CHECK 2

Force on a Negative Charge

Downward, opposite the electric field.

WHY IT WORKS Apply the relevant electric-field relationship and direction rule.

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.