
Pennsylvania 9 Integrated / Physical Science

FREE PREVIEW

Full-Year Teacher Planner, Blank Editable Planner & School-Submission Binder

This preview shows the real structure and a genuine sample of the completed planner. The full product contains 9 units, 36 weekly plans and 180 daily plans, plus blank editable versions of every form.

State	Pennsylvania
Grade	9 (High)
Subject	Integrated / Physical Science
Course category	Science
Standards family	Science
Framework	Science (STEELS)
Issuing agency	Pennsylvania Department of Education
Scope	36 instructional weeks · 180 instructional days · 9 units

This is a statewide standards index, not a local course catalog. Course names, grade placement, electives, and graduation sequences vary by district.

What you get

Folder	Contents
01 START HERE	Read-me, contents, printing and digital instructions, standards verification guide, this preview
02 FILLED FULL YEAR	Completed planner in colour and ink-friendly PDF, plus editable DOCX
03 BLANK EDITABLE	Blank planner in colour, ink-friendly and fillable PDF, plus editable DOCX
04 ASSESSMENTS AND DATA	Baseline observation, quarterly rubrics, anecdotal forms, portfolio checklist
05 SCHOOL SUBMISSION	Submission covers, alignment summary, evidence checklist, observation, reflection, signature page
06 LICENSE AND CREDITS	Terms of use, credits and licences, copyright notice

The pages that follow are reproduced **exactly** as they appear in the full completed planner.

Week 9 — Waves at a Boundary

Unit 3: How Waves Behave • Month 3 • Quarter 1 • Semester 1 • Instructional Days 41–45

Essential question	What happens when a wave meets something?
Standards	Mechanical and Electromagnetic Waves -> 3.2.9-12.B, 3.2.9-12.C, 3.2.9-12.D, 3.2.9-12.E — 4 standards; full text in the standards table
Learning target	"I can model all four wave behaviours and say what each requires."
Local dates	_____ (enter your school dates)

Measurable objectives

- Students will develop models to illustrate reflection, refraction, interference and diffraction.

Success criteria (student-friendly)

- "I model each of the four behaviours."
- "I state the condition each requires."
- "I identify which behaviour explains a given observation."

Academic vocabulary

reflection, refraction, interference, diffraction, boundary, superposition

Materials and technology

- Water trays or springs
- Torches if available
- Graph paper
- Printed diagrams

Differentiation and supports

Support area	This week's plan
Special education / IEP	Reduce group size; pair visual cue cards with all verbal directions; allow gesture or picture response in place of speech; pre-teach the week's target in a 1:1 warm-up.
Section 504	Provide the child's documented accommodations throughout; permit movement breaks and alternative seating at any point in the sequence.
Multilingual learners	Introduce each vocabulary word with an object or image; accept home-language responses; send the vocabulary list home where a translation is available; pair with a peer who shares the home language.
Advanced / extension	Ask the learner to teach the skill to a peer, extend the task, or record a demonstration for the class reference wall.
Intervention / reteach	Reteach the target in a short small group using the same materials; split the day's check for understanding into two smaller steps.
Enrichment	Extend into an open-ended centre or project connected to the essential question.

Assessment and evidence

Four behaviours modelled with their conditions stated.

Family communication

Ask your child why a straw looks bent in a glass of water.

Day 41 — Reflection

Week 9, Day 1 · Unit 3 · Standards: 3.2.9-12.B, 3.2.9-12.C, 3.2.9-12.D, 3.2.9-12.E

Focus	Bouncing back.
Learning target	"I can model all four wave behaviours and say what each requires."
Vocabulary in use	reflection, refraction, interference, diffraction, boundary, superposition
Local date	_____

Learning sequence

Connect: waves. Teach: reflection at a boundary and the relationship between the incoming and outgoing directions, modelled with a spring or a water tray. Try: shared modelling. Apply: students model reflection and record the relationship. Reflect: the wave did not stop; it changed direction.

Check for understanding

Student models reflection and states the direction relationship.

Differentiation in the moment

If the learner...	Then...
needs more support	Model the step again with guided support, then fade to a gesture cue.
is ready for more	Invite the learner to demonstrate for a peer or add a second example.
is dysregulated	Pause instruction, move to co-regulation, and return to the target later.

Closure and reflection

Gather the group. Restate the learning target. Ask one learner to demonstrate. Name one specific thing the group did well, then preview tomorrow.

Teacher reflection (fictional example)

Fictional Example — Customize and Verify Before School Submission.

Most learners met the target. Two needed the visual cue repeated during guided practice; I will pre-teach with them tomorrow. The extension held attention longer than planned, so I shortened closure.

Day 42 — Refraction

Week 9, Day 2 · Unit 3 · Standards: 3.2.9-12.B, 3.2.9-12.C, 3.2.9-12.D, 3.2.9-12.E

Focus	Bending on entry.
Learning target	"I can model all four wave behaviours and say what each requires."
Vocabulary in use	reflection, refraction, interference, diffraction, boundary, superposition
Local date	_____

Learning sequence

Connect: reflection. Teach: refraction as a change of direction caused by a change of SPEED at a boundary, which is the part usually left out - the bending is a consequence, not the cause. Try: shared modelling. Apply: students model refraction and explain the cause. Reflect: it bends because it slows, and next week explains why it slows.

Check for understanding

Student explains refraction as a consequence of a speed change.

Differentiation in the moment

If the learner...	Then...
needs more support	Model the step again with guided support, then fade to a gesture cue.
is ready for more	Invite the learner to demonstrate for a peer or add a second example.
is dysregulated	Pause instruction, move to co-regulation, and return to the target later.

Closure and reflection

Gather the group. Restate the learning target. Ask one learner to demonstrate. Name one specific thing the group did well, then preview tomorrow.

Teacher reflection (fictional example)

Fictional Example — Customize and Verify Before School Submission.

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Day 43 — Interference

Week 9, Day 3 · Unit 3 · Standards: 3.2.9-12.B, 3.2.9-12.C, 3.2.9-12.D, 3.2.9-12.E

Focus	Waves meeting.
Learning target	"I can model all four wave behaviours and say what each requires."
Vocabulary in use	reflection, refraction, interference, diffraction, boundary, superposition
Local date	_____

Learning sequence

Connect: waves in one medium. Teach: two waves overlapping and adding, with reinforcement and cancellation modelled on graph paper by adding displacements point by point. Try: shared addition of two waves. Apply: students add two waves and identify both effects. Reflect: cancellation is not destruction; move along and the waves continue.

Check for understanding

Student models interference by adding displacements.

Differentiation in the moment

If the learner...	Then...
needs more support	Model the step again with guided support, then fade to a gesture cue.
is ready for more	Invite the learner to demonstrate for a peer or add a second example.
is dysregulated	Pause instruction, move to co-regulation, and return to the target later.

Closure and reflection

Gather the group. Restate the learning target. Ask one learner to demonstrate. Name one specific thing the group did well, then preview tomorrow.

Teacher reflection (fictional example)

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Day 44 — Diffraction

Week 9, Day 4 · Unit 3 · Standards: 3.2.9-12.B, 3.2.9-12.C, 3.2.9-12.D, 3.2.9-12.E

Focus	Spreading round.
Learning target	"I can model all four wave behaviours and say what each requires."
Vocabulary in use	reflection, refraction, interference, diffraction, boundary, superposition
Local date	_____

Learning sequence

Connect: boundaries. Teach: diffraction as spreading at a gap or edge, and that the amount depends on the gap size relative to the wavelength - which is why you hear round a corner but do not see round one. Try: shared modelling with a water tray or supplied diagrams. Apply: students model and explain the corner observation. Reflect: one relationship explains a difference between sound and light you have noticed all your life.

Check for understanding

Student explains diffraction differences using wavelength and gap size.

Differentiation in the moment

If the learner...	Then...
needs more support	Model the step again with guided support, then fade to a gesture cue.
is ready for more	Invite the learner to demonstrate for a peer or add a second example.
is dysregulated	Pause instruction, move to co-regulation, and return to the target later.

Closure and reflection

Gather the group. Restate the learning target. Ask one learner to demonstrate. Name one specific thing the group did well, then preview tomorrow.

Teacher reflection (fictional example)

Fictional Example — Customize and Verify Before School Submission.

Most learners met the target. Two needed the visual cue repeated during guided practice; I will pre-teach with them tomorrow. The extension held attention longer than planned, so I shortened closure.

Day 45 — Which Behaviour Explains This

Week 9, Day 5 · Unit 3 · Standards: 3.2.9-12.B, 3.2.9-12.C, 3.2.9-12.D, 3.2.9-12.E

Focus	Application.
Learning target	"I can model all four wave behaviours and say what each requires."
Vocabulary in use	reflection, refraction, interference, diffraction, boundary, superposition
Local date	_____

Learning sequence

Connect: four behaviours. Teach: identifying which behaviour explains each of several observations, including one that needs two. Try: shared identification for three. Apply: students identify the behaviour for five observations. Reflect: the four together explain nearly everything waves do at a boundary.

Check for understanding

Student identifies the behaviour explaining an observation.

Differentiation in the moment

If the learner...	Then...
needs more support	Model the step again with guided support, then fade to a gesture cue.
is ready for more	Invite the learner to demonstrate for a peer or add a second example.
is dysregulated	Pause instruction, move to co-regulation, and return to the target later.

Closure and reflection

Gather the group. Restate the learning target. Ask one learner to demonstrate. Name one specific thing the group did well, then preview tomorrow.

Teacher reflection (fictional example)

Fictional Example — Customize and Verify Before School Submission.

Most learners met the target. Two needed the visual cue repeated during guided practice; I will pre-teach with them tomorrow. The extension held attention longer than planned, so I shortened closure.

Important before you buy

- This is a **digital download**. Nothing is shipped.
- The planner is **calendar-neutral**: Month 1–9, Week 1–36, Day 1–180, so it fits any school calendar. You add your own dates.
- Standards were transcribed from the official source.
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Source citation

Pennsylvania Department of Education. Science (STEELS). STEELS took effect 1 July 2025; the 2002 science standards in Appendix B were struck from the Code and sunset 30 June 2025. Retrieved 2026-07-27 from <https://www.pacodeandbulletin.gov/Display/pacode?file=%2Fsecure%2Fpacode%2Fdata%2F022%2Fchapter4%2Fchap4toc.html>