Montana 11 Physics

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	Montana
Grade	11 (High)
Subject	Physics
Course category	Science
Standards family	Science
Framework	Montana Science Content Standards (2016), codified at ARM 10.53 subchapter 8
Issuing agency	Montana Office of Public Instruction
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 — Work and Power

Unit 3: Work, Power and Energy · Month 3 · Quarter 1 · Semester 1 · Instructional Days 41–45

Essential question	What does a physicist mean by work, and how fast can it be done?
Standards	**Conservation of Energy and Momentum** -> **ARM 10.53.810(1)(k), ARM 10.53.810(1)(o), ARM 10.53.810(1)(p), ARM 10.53.810(1)(q)** — 4 standards; full text in the standards table
Learning target	"I can compute work and power and explain how they relate through time."
Local dates	____________________________ (enter your school dates)

Measurable objectives

- Students will use mathematical and computational thinking to explain the relationships among work, power, and time.

Success criteria (student-friendly)

- "I compute work done by a force."
- "I explain when a force does no work."
- "I compute power as work over time."

Academic vocabulary

work, joule, power, watt, force, displacement, component, energy transfer, rate

Materials and technology

- Notebooks
- Supplied problem sets
- Newton meters
- Metre rules
- Laboratory masses

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.

Support area	This week's plan
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

Student computes work and power and identifies zero-work cases.

Family communication

Ask your child whether carrying a heavy bag along a flat corridor does any work.

Day 41 — Work Is Not What You Think It Is

Week 9, Day 1 · Unit 3 · Standards: ARM 10.53.810(1)(k), ARM 10.53.810(1)(o), ARM 10.53.810(1)(p), ARM 10.53.810(1)(q)

Focus	The definition.
Learning target	“I can compute work and power and explain how they relate through time.”
Vocabulary in use	work, joule, power, watt, force, displacement, component, energy transfer, rate
Local date	____________________

Learning sequence

Connect: hold a heavy mass still at arm's length until it aches - how much work have you done? Teach: none, in the physics sense. WORK is force times displacement in the direction of the force, measured in joules, so with no displacement there is no work however tired you are. The everyday word and the physics word are different, and the physics one is precise. Try: shared computation of work for three supplied cases including a zero. Apply: students compute work for five cases with units. Reflect: your arm aches because of what is happening inside your muscles, which is biology rather than a counterexample.

Check for understanding

Student computes work and identifies cases where no work is done.

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 — Force at an Angle

Week 9, Day 2 · Unit 3 · Standards: ARM 10.53.810(1)(k), ARM 10.53.810(1)(o), ARM 10.53.810(1)(p), ARM 10.53.810(1)(q)

Focus	The component that counts.
Learning target	“I can compute work and power and explain how they relate through time.”
Vocabulary in use	work, joule, power, watt, force, displacement, component, energy transfer, rate
Local date	____________________

Learning sequence

Connect: a case pulled along by a strap at an angle to the floor. Teach: only the component of the force ALONG the displacement does work, so the work is the force times the displacement times the cosine of the angle between them - which is Unit 1's resolving, again. A force perpendicular to the motion does NO work at all, which is why the normal force never does any and why Unit 6's centripetal force will not either. Try: shared computation of work at three angles for the same force and displacement. Apply: students compute work for four angled cases and identify a zero-work force in each of two situations. Reflect: the perpendicular result is worth remembering; Unit 6 depends on it.

Check for understanding

Student computes work with an angled force and identifies zero-work forces.

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 43 — How Fast the Work Is Done

Week 9, Day 3 · Unit 3 · Standards: ARM 10.53.810(1)(k), ARM 10.53.810(1)(o), ARM 10.53.810(1)(p), ARM 10.53.810(1)(q)

Focus	Power.
Learning target	“I can compute work and power and explain how they relate through time.”
Vocabulary in use	work, joule, power, watt, force, displacement, component, energy transfer, rate
Local date	____________________

Learning sequence

Connect: two students carry identical loads up identical stairs, one in half the time. Teach: they did the SAME WORK and the faster one delivered more POWER, because power is work divided by time, measured in watts. One watt is one joule per second. Power says nothing about how much was done, only how quickly. Try: shared computation of power for three supplied cases. Apply: students compute power for five cases and rearrange for work and for time. Reflect: a small motor can do any amount of work given enough time, which is the practical meaning of the distinction.

Check for understanding

Student computes power and rearranges the relationship for each quantity.

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 44 — Measuring Power in the Laboratory

Week 9, Day 4 · Unit 3 · Standards: ARM 10.53.810(1)(k), ARM 10.53.810(1)(o), ARM 10.53.810(1)(p), ARM 10.53.810(1)(q)

Focus	Practical, low hazard.
Learning target	“I can compute work and power and explain how they relate through time.”
Vocabulary in use	work, joule, power, watt, force, displacement, component, energy transfer, rate
Local date	____________________

Learning sequence

TEACHER NOTE: raising a laboratory mass a measured height at a steady rate using a newton meter or string over a pulley, at bench scale. NO STUDENT'S OWN BODY IS THE APPARATUS - this plan does not time students climbing stairs or lifting their own weight, because that turns a measurement into a comparison between classmates. SUPPLIED DATA IS AVAILABLE. Connect: measure a real power output. Teach: measure the force, the distance and the time; work is force times distance and power is work over time. Repeat and average. Try: shared run of one trial. Apply: students take three trials, compute power each time and average. Reflect: your three values differ; quoting the spread is part of the result.

Check for understanding

Student measures force, distance and time and computes a power output.

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 — Power the Other Way Round

Week 9, Day 5 · Unit 3 · Standards: ARM 10.53.810(1)(k), ARM 10.53.810(1)(o), ARM 10.53.810(1)(p), ARM 10.53.810(1)(q)

Focus	Computational thinking.
Learning target	“I can compute work and power and explain how they relate through time.”
Vocabulary in use	work, joule, power, watt, force, displacement, component, energy transfer, rate
Local date	____________________

Learning sequence

Connect: a machine rated at 500 W - how long to raise a stated load a stated height? Teach: the sub-part says use mathematics AND COMPUTATIONAL THINKING to explain the relationships among work, power and time, and that means working in any direction round the triangle and knowing which quantity the question actually wants. Work out the work required first, then divide. Try: shared solution of two reverse problems. Apply: students solve five problems, each solving for a different quantity. Reflect: identifying which of the three you are being asked for is most of the difficulty.

Check for understanding

Student solves work-power-time problems for any unknown.

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

Montana Office of Public Instruction. Montana Science Content Standards (2016), codified at ARM 10.53 subchapter 8. Statements are transcribed from the MONTANA SCIENCE CONTENT STANDARDS, whose own cover reads "Adopted September 16, 2016 by the Montana Board of Public Education". THAT DOCUMENT PRINTS NO CODES. Each grade is a set of discipline headings -- physical science, life science, earth and space science -- followed by unnumbered bullets, so there is nothing in it that can be printed in a code column. The same standards are codified in the ADMINISTRATIVE RULES OF MONTANA, CHAPTER 10.53 SUBCHAPTER 8, one rule per grade, and the rule's structure is exactly the document's: a numbered subsection per discipline heading, a lettered item per bullet, same order and same count. THE ARM SUBSECTION IS REGISTERED AS THE CODE. This is an existing official citation rather than an invented identifier, and it is the citation a Montana reviewer can actually look up; the alternative would have been to ship science products with no codes at all. Bullets are separated in the PDF by a Symbol-font character in the Unicode Private Use Area rather than by a literal dot; splitting on the indent instead merges a whole discipline into one run, and splitting per line fragments every standard mid-sentence, so the glyph is what the transcription splits on and the item count is checked against the counts the document's headings imply. THIS STATE PUBLISHES NO PHYSICS COURSE. It writes ONE SCIENCE RULE FOR THE WHOLE OF GRADES 9-12, ARM 10.53.810, holding sixty-one standards in three disciplines, and it assigns none of them to a grade or to a course. The physics content sits inside the twenty-three-standard PHYSICAL SCIENCE discipline, so a physics year here is a district's selection from subsection (1). THIS ROW REGISTERS FOURTEEN OF THE TWENTY-THREE: force and motion, momentum and collisions, gravitation and Coulomb's law, fields, energy and its conversion, and the whole of the wave and electromagnetic-radiation group. The nine it leaves are the chemistry ones -- the periodic table, bonding, reactions, equilibrium and conservation of mass -- which the chemistry course in this series carries. ONE THING YOU SHOULD KNOW BEFORE YOU BUY: THIS STATE PUBLISHES NO FLUID MECHANICS STANDARD AT ALL, and this plan teaches pressure and buoyancy. Those weeks are registered

against (1)(b), the bulk-scale structure standard their behaviour follows from, and they are content beyond the state's requirement rather than a requirement you are meeting. Retrieved 2026-07-27 from https://opifiles.mt.gov/Portals/182/Page%20Files/K-12%20Content%20Standards%20%26%20Revision/Science/Montana-Science-Content-Standards-2016.pdf