

Substitute Guide: Linear Functions in Four Forms

Course: Algebra I (Grades 9–12) **Subject:** Mathematics **Time:** ~50 min standard · ~90 min block Math

Learning goal (plain language)

Students practice **linear functions** — connecting the same "straight-line" function across a **table**, a **graph**, an **equation** in function notation $f(x) = mx + b$, and a **real-world context**. They find the **slope** (the rate of change, m), the **y-intercept** (the starting amount, b), **write** equations from contexts, and **solve** equations such as $f(x) = k$. **You do not need a math background to run this.** Every formula and a worked example are printed in the student packet. Students **show their work**; you do not need to teach the method — the packet does the teaching. Your job is to hand it out, read the start script, keep the room on task, and collect the packets.

Standards alignment

Framework: 19 TAC §111.39 (Algebra I). Knowledge & skills for linear functions — slope as a rate of change, writing linear equations, solving linear equations, and interpreting linear functions in context.

- **Provisional — A.2(C):** write linear equations in slope-intercept form ($y = mx + b$ or $f(x) = mx + b$) given a table, a graph, or a verbal description.
- **Provisional — A.3(A):** determine the slope of a line as a rate of change given two points, a table, or a graph.
- **Provisional — A.3(B):** interpret the meaning of slope and intercepts of a linear function in the context of a real-world situation.
- **Provisional — A.5(A):** solve linear equations in one variable, including equations of the form $f(x) = k$.

Provisional — pending educator verification against the current official TAC source.

(Standards are paraphrased here, not quoted. Please confirm codes and wording against your official source. This packet is **not** claimed to be "aligned to the TEKS" until reviewed.)

Setup Before class (5 min)

- Count and hand out one **student packet** per student.
- Confirm each student has a **pencil**. A **basic or graphing calculator is allowed but not required**; students who have one may use it.
- Write the date on the board and remind students to fill in the name line.
- Keep the **answer key** with you — it is a separate file and is **not** in the student packet.
- **Standard vs. block:** on a ~50-minute period, students do items 1–6, 8, and ACE (item 7 is optional). On a ~90-minute block, students also complete **item 7**, the extra applied modeling task.

Materials What's needed

- Printed student packet (5–7 pages) per student.
- Pencil per student; a basic four-function or graphing calculator is optional.
- This guide and the separate answer key (teacher only).
- No technology, no internet, no special supplies.

Timing Suggested pacing (standard ~50 min • block ~90 min)

Segment	Standard (~50 min)	Block (~90 min)	What students do
Start — Retrieval warm-up	6 min	8 min	Q1–Q2 (evaluate $f(x)$; slope from two points)
Build — Study the math	8–12 min	12–15 min	Read reference box, worked example, graph; Q3
Apply — Use what you know	20–26 min	28–34 min	Q4–Q6 (four forms + solve, write from context, error analysis)
Block — Extra applied task	optional	12–15 min	Q7 (draining-tank modeling; x-intercept)
Explain — Justify (CER)	6–10 min	8–12 min	Q8 claim/evidence/reasoning
Close — ACE	5 min	5–7 min	Articulate / Connect / Extend
Continue — early finishers	optional	optional	Write a context for $f(x) = 7x + 20$

Script Read aloud to start

"Today's assignment is a paper math packet called *Linear Functions in Four Forms*. You will work by yourself with a pencil. A basic or graphing calculator is allowed if you have one, but you do not need one. The most important rule: **show your work** — write down the numbers and steps you use, not just a final answer. Everything you need is printed in the packet, including a worked example, a graph, and all the formulas. Start with the warm-up, then read the Build section before the Apply questions. If a question is tricky, skip it and come back. Put your name, class period, and date at the top now. You have about [50 / 90] minutes; raise your hand if you need help reading a question."

Support When students ask for help

- **Students show their work; you do not need to teach the method.** Point them back to the printed **reference box** and the **worked example** — the method is right there.
- **You may read any part aloud** to a student or the class.
- If a student is stuck, prompt with "What does the worked example do?" or "In $f(x) = mx + b$, which number is the rate and which is the starting amount?" rather than giving the answer.
- For slope, remind them the packet shows: $\text{slope} = \text{rise} \div \text{run} = (\text{change in output}) \div (\text{change in } x)$, with the output-difference on top.
- Remind students that **$f(4)$ means the output at $x = 4$** — it is not "f times 4."
- It is fine if a student cannot finish the optional early-finisher challenge.

Access Accommodations & language support

- **Read-aloud** of any question is allowed for all students.
- Point students to the **worked example**, the **formulas** in the reference box, and the **sentence stems** for Q8 and ACE.
- A **calculator is allowed** for any student who wants one — this removes the arithmetic barrier so students can focus on the reasoning.
- Extended time is fine; the core can stop after Q8 if time runs short.
- Students may show work with numbers and short phrases if writing full sentences is a barrier, as long as the reasoning is clear.

- The packet is grayscale-safe — the graph uses black lines, labeled points, and text, so it prints and reads clearly in black and white.

Tools Allowed & not allowed

Allowed: pencil, the printed packet, a basic or graphing calculator, quiet self-read-aloud. **Not needed / not allowed:** phones for messaging, internet, AI tools, or getting answers from another student.

Collect at the end: Collect every packet, whether finished or not, with names on them. Stack them for the teacher. Note on a sticky how far most students got and any questions that caused confusion.

Answer key: The **answer key is a separate file** (answerkey.html) and is for the teacher only. Please do not hand it to students.

Teacher follow-up (for the returning teacher)

The highest-value items to review next class are the **error analysis (Q6)** and the **justification (Q8)**, which reveal the reversed rise/run slope error and whether students can compare two linear functions using both slope and y-intercept. Watch for **slope vs. y-intercept swaps** on the four-forms item (Q4), the **f(x)-as-multiplication** misconception, and the belief that **every line is proportional** (Q4e, Q8 check this — only lines through the origin are). The **solve** items (Q4d, Q7c) and the ACE Articulate prompt show who can move from evaluating a function to solving $f(x) = k$. The separate answer key lists worked steps, alternate strategies, misconceptions, and a 3-point rubric for Q8.

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