Trace the Routing Rule

Grade 9 | Technology | Task cards | 40 minutes

Learning target

Trace a conditional algorithm and locate a boundary-value error.

Prerequisites and materials

Whole-number comparison and multiplication. Provide pages 2-3, pencil, and a calculator if needed. These are paper-based analyses of fictional data; no physical experiment is required.

Teaching sequence

5 min: Introduce the model and vocabulary.

10 min: Partners rehearse the four card tasks.

15 min: Each learner records calculations and reasoning.

7 min: Compare methods and revise one response.

3 min: Explain one assumption or limitation.

Assessment and access

12 points: 3 per response. Keep calculations, units, and reasoning visible. Allow oral rehearsal, annotate variables, and supply a calculator or worked example with different values during practice. For assessment, clarify directions without giving answers.

Extension

Write test cases for 0, 5, and 6, and explain why a negative mass should be rejected before this model runs.

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PREVIEW - first two pages only. Full package includes responses and answer key.



Lesson reference

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Use this fictional parcel-routing algorithm on paper. Input mass m is a nonnegative whole number of kilograms. No software or device is required.

Vocabulary	Meaning
algorithm	A precise sequence of steps.
condition	A true-or-false test that selects a branch.
boundary value	An input at the edge of a rule's ranges.

Reference data

Step	Instruction
1	Read m.
2	If m <= 5, set route = A and cost = 2m + 3.
3	Otherwise, set route = B and cost = 3m + 1.
4	Output route and cost in model credits.

Rules and assumptions

A condition is evaluated before its branch runs. Equality is included in <=. Each card is a separate run; reset the input each time.



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