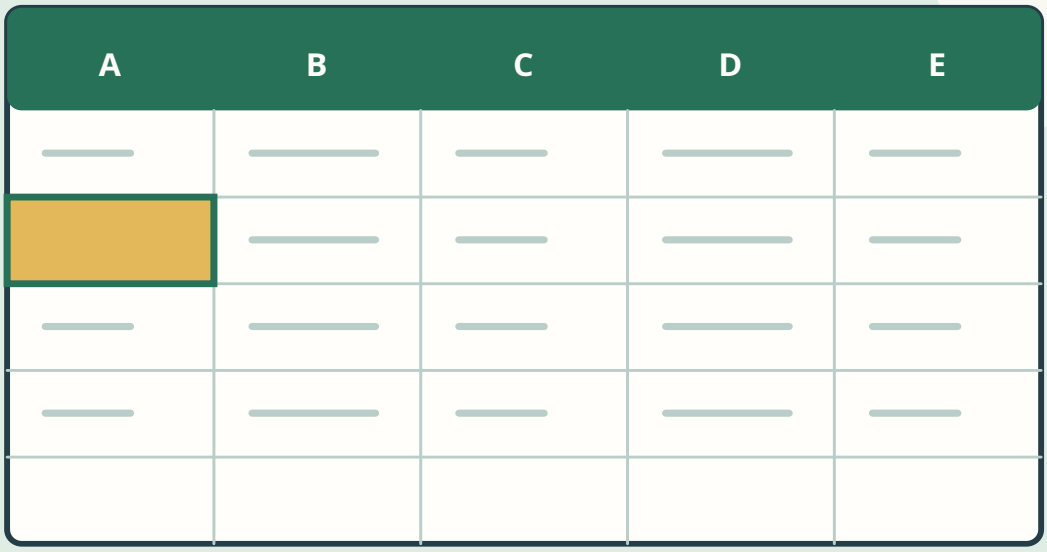
SAFE REPORT FILTERS

Adding Safe Filters to Recurring Reports



FILTER / SCOPE

Adding Safe Filters to Recurring Reports

Learning outcomes

- Expose the current filter population to the reader.
- Test three filter combinations against source records.
- Reset all filter mechanisms before claiming an overall total.
- Specify complete predicates and distinguish unrestricted from standard working states.
- Test counts, quantities and exact IDs across category, date, zero and no-match cases.
- Inventory filter mechanisms and verify actual report connections.
- Preserve source evidence, expose unspecified categories and deliver self-contained scope captions.

Practical office learning with wholly fictional records. No certification, compliance opinion, or authorization to act on real records is implied.

Study the foundations, work through the applied units, complete the practice tasks, and then attempt the assessment. Use only the supplied fictional practice data. Keep your original inputs and your revised work separate.

Core concepts

Filters change the population

A filter is a rule deciding which records are currently represented. It is not just a way to tidy labels. A report titled All resource usage becomes misleading if a department selection remains active. Keep the reporting period, selected categories and refresh date near the result. "Multiple items" is often insufficient for an exported or printed report because it does not identify which items. State the actual selections or supply a readable filter summary. Distinguish no matching records from a failed refresh; both can produce a sparse display but require different explanations.

Use visible controls without assuming exclusivity

Slicers expose selected category buttons and can help a reader see the current state. They do not prove that no other filter exists. Report filters, label filters, value filters and date filters can operate alongside them. Inspect all active mechanisms during testing. If several pivots are intended to respond together, check their report connections and compatible shared source. A slicer placed beside a chart does not automatically control that chart. Provide reset instructions that cover every filter mechanism used in this workbook, not merely one clear button.

Create a reproducible filter test

For each requested combination, first write the exact predicate, then select matching IDs directly from the source and add their quantities. Apply the report controls and compare the displayed total, visible labels and scope note. Clear all controls between tests to avoid inheriting an unnoticed selection. After the final reset, independently confirm the full record count and quantity. Capture the selected state with the output if it will be exported; an interactive control that was not printed cannot explain a PDF reader's denominator.

Worked example

Scenario: Mini-data: North/Guide/2, North/Template/3, South/Guide/4.

Walkthrough

Selecting Guide gives 6 units. Selecting North as well narrows the intersection to 2, not the union of North and Guide. Clearing only the Department slicer restores 6 because Guide is still selected. Only after clearing both controls does the total return to 9. The title should describe each population rather than remain All usage throughout.

Foundation practice

ReceiptID	UsedOn	Department	ResourceType	Quantity
U01	2025-12-02	Design	Guide	4
U02	2025-12-14	Support	Guide	3
U03	2025-12-20	Design	Template	2
U04	2026-01-03	Support	Template	5
U05	2026-01-07	Design	Guide	6
U06	2026-01-09	Support	Guide	4
U07	2026-01-12	Design	Template	3
U08	2026-02-01	Support	Template	7
U09	2026-02-04	Design	Guide	5
U10	2026-02-11	Support	Guide	2
U11	2026-02-18	Design	Template	4
U12	2026-02-22	Support	Template	6

Context

Fictional learning-resource desk. One row records one receipt; Quantity counts resource units, not people. All dates are Gregorian ISO dates, with no time zone conversion.

Types

- text identifier
- date
- text category
- text category
- whole number of resource units

Tests

name	department	resource type	period
F1	Design	All	All supplied dates
F2	Support	Guide	All supplied dates
F3	All	Template	2026-02-01 through 2026-02-28

Hidden filter fault: An inherited report has a date filter excluding December, although its slicers show all departments and resource types.

Foundation tasks

- Identify the inherited hidden filter and create visible controls plus a scope note.
- Run F1, F2 and F3 from a cleared state; trace each result to source IDs.

Foundation capstone

Task: Submit an interactive pivot sheet, reset instructions and the three-test evidence log.

Criteria

- Selections and period are explicit.
- All three totals reconcile.
- Reset restores the full population.
- No report is labeled overall while an undisclosed filter remains.

01 Treat the filter state as part of the report definition

The fictional Linden Equipment Desk tracks work orders at North, South and Remote sites. One row is one work order, identified by WorkID. Units counts equipment units associated with that order, not people or labor hours. The supplied eighteen records span August, September and one October boundary record. The task is to build filters whose selections, outputs and reset behavior can be verified.

A filtered report describes a selected population. Site=South, Service=Repair and Status=Closed means the intersection of all three conditions, not every South order plus every Repair order. A date interval adds another condition. The title, scope note and visible

controls should communicate that population so a reader does not mistake a selected total for the entire source.

The unrestricted source contains eighteen orders and 72 units. A standard monthly working view is separately defined as September 2026 with Status=Closed and all sites/services. That view contains five orders and twenty units. These are both useful baselines, but they serve different purposes. Clearing all filters and restoring the standard monthly view are not the same operation.

Filters do not authorize editing or deleting source records. Cancelled orders and an order with unspecified status remain in the supplied population. A report can exclude them for a stated purpose, but the exclusion must be visible. The source itself should remain intact so another report can ask a different question or reconcile the complete extract.

The goal is not to add as many controls as possible. Use the smallest set that implements the intended questions, then test every mechanism that can affect inclusion. A visible slicer can make one selection obvious while a hidden date or value filter still narrows the result. Safe recurring reporting depends on a known state, not merely a convenient set of buttons.

Named state	Definition	Expected orders	Expected units
Unrestricted supplied source	All sites, services, statuses; August 1 through October 1 included	18	72
Standard September closed view	2026-09-01 <= OpenedOn < 2026-10-01; Closed; all sites/services	5	20
September all-status view	Same September dates; all statuses	9	32

E01-X1 Define two reset destinations

Write the exact unrestricted-source and standard-September-closed predicates. Give their expected counts and units and explain why one reset button cannot be assumed to mean both.

Submit: Two state definitions and a reset distinction.

02 Inspect source facts before constructing controls

The files work_orders.csv and safe_filter_lab.xlsx contain the same eighteen synthetic work orders. In the workbook, Orders occupies Source!A1:I19. Columns A:F are the supplied facts. G is StatusLabel, H is Included and I is IncludedUnits, all derived for the formula-based selection lab. The main source remains unchanged when a selection changes.

OpenedOn is a local Gregorian date with no time zone or time-of-day conversion. Units is a nonnegative integer. W06 and W11 have known zero units and remain valid work orders. W16 has a blank raw Status, meaning the classification is not supplied. The helper

StatusLabel displays Unspecified for that record while preserving the original blank in column E.

Unspecified is not another spelling of Open, Closed or Cancelled. It is an explicit label for missing classification. All-status selection includes W16, while a Closed selection excludes it because its status is not known to be Closed. The report should not silently convert a blank status into whichever category makes a total look reasonable.

The source controls are eighteen unique WorkIDs, eighteen numeric Units values and total 72. Site totals are North 27, South 23 and Remote 22. Month totals are August 31, September 32 and October nine. These controls support later filter tests, but exact matching IDs remain important because equal quantities can hide selection errors.

Read the source table once and use identifiers in your test ledger. A screen showing three visible rows does not prove which three orders were selected. A ledger listing W10 and W14 for September Closed Setup is reproducible even if the workbook is sorted differently. The filter is a predicate over records, not a particular screen arrangement.

WorkID	OpenedOn	Site	Service	Status	Units
W01	2026-08-01	North	Repair	Closed	4
W02	2026-08-03	North	Setup	Open	2
W03	2026-08-05	South	Repair	Closed	6
W04	2026-08-08	South	Inspection	Closed	3
W05	2026-08-12	Remote	Setup	Closed	5
W06	2026-08-15	North	Inspection	Closed	0
W07	2026-08-20	Remote	Repair	Open	7
W08	2026-08-31	South	Setup	Cancelled	4
W09	2026-09-01	North	Repair	Closed	8
W10	2026-09-04	South	Setup	Closed	2
W11	2026-09-07	Remote	Inspection	Closed	0
W12	2026-09-10	North	Setup	Open	3
W13	2026-09-15	South	Repair	Open	5
W14	2026-09-20	Remote	Setup	Closed	6
W15	2026-09-25	North	Inspection	Cancelled	1
W16	2026-09-28	South	Inspection		3
W17	2026-09-30	Remote	Repair	Closed	4

WorkID	OpenedOn	Site	Service	Status	Units
W18	2026-10-01	North	Setup	Closed	9

03 Write predicates in plain language and Boolean form

A predicate is the rule that decides whether a record belongs in the current report. Write it before clicking controls. For South closed repairs, the rule is Site equals South AND Service equals Repair AND StatusLabel equals Closed, with all supplied dates included. Only W03 satisfies all three conditions; W13 is South Repair but Open, so it is excluded.

Selections within a single category field commonly act as alternatives. Selecting North and South means Site is North OR Site is South. When combined with Service=Setup, the full rule is (North OR South) AND Setup. The parentheses matter. North OR (South AND Setup) would include every North order regardless of service and produce a different population.

A date condition is another AND clause. September is OpenedOn greater than or equal to September 1 and less than October 1. The half-open interval includes W09 on September 1 and W17 on September 30 but excludes W18 on October 1. A consistent boundary rule makes adjacent periods nonoverlapping.

Do not confuse a label search with a complete predicate. Searching for Repair can help locate a category, but you still need to know whether the selected field is Service, whether other selections remain active and whether the search action changed the checked items as intended. The final inclusion rule is what matters, not the text typed into a search box.

Translate the intended predicate into an expected-ID set from the source before testing the report. That independent set gives you a clear acceptance criterion. If you derive the expected IDs by copying the already-filtered report, you are using the same potentially faulty mechanism on both sides of the test. Independence is what makes a mismatch informative.

Selection	Boolean meaning	Example membership
South + Repair + Closed	South AND Repair AND Closed	W03 only
North and South + Setup + September	(North OR South) AND Setup AND September	W10, W12
Remote + Inspection + Closed + September	Remote AND Inspection AND Closed AND September	W11
North + Inspection + Open	North AND Inspection AND Open	No matching records

The supplied formula lab accepts one site or All in Control!B4; it does not accept a combined North-and-South string. For this multi-site exercise, derive the membership directly from work_orders.csv or use a native report with multi-selection. State which method you use. Do

not enter a combined value into the single-site selector and interpret its validation warning as a no-match result.

E03-X1 Resolve an OR-within, AND-across selection

Select North or South, Setup service, any status, and September dates. List exact IDs, order count and units. Explain why North OR (South AND Setup) is not equivalent.

Submit: A predicate and source-derived expected result.

04 Inventory every filtering mechanism

A workbook can have table AutoFilters, PivotTable report filters, row or column label filters, value filters, date filters and slicers. These mechanisms can coexist. A slicer showing all sites proves only its own selection state, not that the date field or a value-based top-item filter is clear. Build an inventory of the mechanisms actually used in the report.

For each mechanism, record the field, object it controls, current selection and reset method. If a slicer controls two pivots, list both. If a PivotTable has a September date filter and a Closed status report filter, those must appear in the inventory even when a large Site slicer dominates the screen. The inventory is a functional map, not a screenshot catalog.

The supplied workbook uses formula selectors on Control rather than native slicers. They are deliberately explicit: Site, Service, StatusLabel, Start inclusive and End exclusive. The Source table may also expose standard filter buttons, but those visibility filters do not drive the formula-selector results. This distinction is part of the exercise, not a hidden limitation.

When creating a native pivot version, choose only the filters needed for the test cases. A good minimal setup might use Site and Service slicers, StatusLabel as a report filter and an explicit OpenedOn date filter. The exact UI depends on the Excel platform. Whatever controls you choose, document their combined state and test their effect.

Avoid redundant filters on the same field unless there is a clear reason. A Site slicer plus a hidden Site label filter can make the selection difficult to understand. If multiple filters per field are intentionally allowed, include that setting in the test plan. Safe filtering is partly about reducing the number of places where an unnoticed restriction can hide.

Mechanism	What to inspect	Reset evidence
Slicer	Selected items and connected report objects	Selection cleared and affected reports reconcile
Report filter	Actual selected values, not only Multiple items	All intended values restored
Label or date filter	Condition and endpoints	Condition removed or reset to named baseline
Value filter	Measure, threshold and ranking scope	No unintended aggregate restriction remains

Mechanism	What to inspect	Reset evidence
Source table filter	Visible rows only or deliberate filtered-source workflow	Do not assume it controls a pivot
Formula selector	Input cells and inclusion formulas	Named input state and calculated controls match

05 Build a transparent formula-selection lab

The supplied Control sheet has editable selectors in B4:B8. B4 is Site, B5 Service, B6 StatusLabel, B7 inclusive Start and B8 exclusive End. The initial values are All, All, All, August 1, 2026 and October 2, 2026. This includes every supplied event date, including W18 on October 1. It is the unrestricted-source test state.

Source!G2 uses =IF(E2="","Unspecified",E2) to create an explicit status label without changing the raw Status. H2 first requires the valid input state shown in Control!B10, then tests the selected categories and date interval, returning one for an included record and zero otherwise. I2 multiplies Units by Included. These helpers make the record-level inclusion decision inspectable rather than hiding it inside an aggregate.

Control!B11 sums IncludedUnits and B12 sums Included flags. B13 independently sums all Orders[Units], while B14 counts all WorkIDs. The full-source controls remain 72 and eighteen as selectors change. That separation lets you see the current result alongside the unchanged population from which it was selected.

The formula lab is not a native filter. Rows remain in the table even when Included is zero, and the workbook does not claim a slicer connection. Its purpose is to provide an independently calculable predicate and expected results for comparison with a native report. If you also apply a source AutoFilter, be clear that it changes visibility but not these selector formulas.

Use the dropdown choices for the three categorical selectors and real date values for the interval. A start date on or after the end date is an invalid test state, not a meaningful empty population. The result cells show N/A and a clear invalid-range message for that case. Distinguishing invalid input from a valid no-match result prevents a configuration error from being mistaken for zero activity.

```
Source!G2 =IF(E2="","Unspecified",E2)
Source!H2 =IF(Control!$B$10<>"Valid",0,IF(AND(
 OR(Control!$B$4="All",C2=Control!$B$4),
 OR(Control!$B$5="All",D2=Control!$B$5),
 OR(Control!$B$6="All",G2=Control!$B$6),
 B2>=Control!$B$7,B2<Control!$B$8),1,0))
Source!I2 =F2*H2
Control!B11 =IF(B10<>"Valid","N/A",SUM(Orders[IncludedUnits]))
Control!B12 =IF(B10<>"Valid","N/A",SUM(Orders[Included]))
```

E05-X1 Write the inclusion formulas at a later row

Give exact G17, H17 and I17 formulas for W16 at source row 17. Under unrestricted selectors, state StatusLabel, Included and IncludedUnits. Then state the values under StatusLabel=Closed with all other selectors unchanged.

Submit: Three formulas and two expected states.

06 Establish a known all-source baseline

Before testing narrower combinations, restore the unrestricted selector state and confirm eighteen orders and 72 units. The date range must include October 1 because that is a supplied source record. A range ending exclusively at October 1 would return seventeen orders and 63 units, not the full source. The difference of nine is W18.

The baseline check has several parts. Confirm the named source and current records, check all filter mechanisms, verify the selector values and inspect the full-source controls. A total of 72 alone could still coexist with a wrong ID set if amounts offset. For this small case, compare the eighteen expected WorkIDs directly.

Do not call this baseline all operational activity outside the exercise. It means all supplied records in the current source. The source does not establish that no other work orders exist. The phrase all supplied dates is accurate because it bounds the claim to the available extract. A wider business claim would need wider evidence.

A baseline record should state the selection values, date endpoints, count, units and observation method. If you use the formula lab, record that it is formula-selector output. If you use a native pivot, record its source and refresh action. Do not merge those observations into one vague statement that the filter worked.

Reset to this baseline between independent tests unless the test specifically examines a sequence of state changes. Starting each test from a known state prevents a leftover Service or date selection from contaminating the next result. It also makes a failed test easier to reproduce because the initial conditions are explicit.

Baseline control	Expected value	What it establishes
WorkIDs	W01-W18 once each	Population membership
Source orders	18	Complete supplied row count
Source units	72	Complete supplied quantity
Selector site/service/status	All / All / All	No category restriction
Date start/end	2026-08-01 / 2026-10-02 exclusive	All supplied dates included
Unrestricted result	18 orders / 72 units	Selection agrees with source

07 Test single-category and intersecting selections

The first test selects Site=North with all services, statuses and dates. Its expected IDs are W01, W02, W06, W09, W12, W15 and W18. Their units are four, two, zero, eight, three, one and nine, totaling 27. The valid zero W06 contributes to the seven-order count even though it adds no units.

The second test selects South, Repair and Closed. W03 qualifies with six units. W13 is also South Repair but Open, so it must not appear. This pair is deliberately chosen to test the status intersection. A result of eleven units would indicate that the Open record was included or the Closed condition was not applied as intended.

The third test selects all sites, Setup, Closed and September dates. W10 contributes two units and W14 contributes six, giving two orders and eight units. W05 is Closed Setup but August, and W18 is Closed Setup but October. They test the date boundaries and must remain excluded from this September result.

For each test, inspect count, quantity, visible labels and scope caption. If the total is right but the caption says all services, the report is still misleading. If the labels look right but the expected IDs differ, investigate the source or hidden filters. Correctness includes both calculation and communication.

Record expected and observed results separately. The expected values come from the supplied source and explicit predicate. The observed values come from the application or formula lab after applying the controls. A pass requires agreement under the same state. Do not type the expected value into the observation field or infer a successful native filter action from an independent calculation.

Test	Selection	Expected IDs	Orders	Units
F1	North; all services/statuses/dates	W01,W02,W06,W09,W12, W15,W18	7	27
F2	South; Repair; Closed; all dates	W03	1	6
F3	All sites; Setup; Closed; September	W10,W14	2	8

E07-X1 Execute three independent filter tests

Run F1, F2 and F3 from the unrestricted baseline, resetting between them. Record exact selector values, expected IDs, observed count/units and scope text. If native Excel is unavailable, label the source-derived predictions and formula observations separately.

Submit: A three-state test ledger.

08 Distinguish no matches from matching zero quantities

A valid selection can return zero units for two different reasons. Remote, Inspection, Closed and September selects W11, which is a real order with zero units. The result is one matching order and zero units. North, Inspection and Open selects no records anywhere in the supplied dates, so its result is zero matching orders and zero units.

A quantity-only display cannot distinguish these states. Pair the quantity with a matching-record count and a meaningful message. For W11, say One matching order; recorded units zero. For the empty selection, say No matching records for the stated selection. Neither message should claim that a refresh failed or that every site had zero activity.

An invalid date range is a third state. Start=October 1 and End=September 1 does not define the intended forward interval. It should produce an input-error message rather than the same no-match message as a valid empty selection. The formula lab explicitly checks Start < End before presenting numeric results.

A failed refresh is a fourth state. It concerns whether the report has current data, not whether the current predicate happens to match records. An empty result cannot diagnose refresh success or failure by itself. Check the source, refresh status and expected IDs separately. Do not invent a system failure merely because a filter combination is sparse.

These distinctions matter in recurring reports because users may act on a zero differently from an unknown or invalid state. A clear count and status message keeps the interpretation close to the number. It also provides an efficient diagnostic: when units are zero, inspect whether the matching count is positive before drawing a conclusion about absence.

Selection or condition	Orders	Units	Correct message
Remote Inspection Closed September	1	0	Matching order with recorded zero units
North Inspection Open, all dates	0	0	No matching records for this selection
Start after end	N/A	N/A	Invalid date range
Refresh not confirmed	Unverified	Unverified	Check freshness before interpreting result

E08-X1 Classify four zero-looking states

For the two named selections, the reversed-date case and an unconfirmed refresh, give the count, units and appropriate message or evidence requirement.

Submit: A four-state result classification.

09 Find a hidden date restriction after slicers are cleared

A hypothetical inherited report has all Site and Service slicer buttons selected, but a date filter excludes August. Its visible population includes September and the October boundary record: ten orders and 41 units. The unrestricted source remains eighteen orders and 72 units. Clearing only the slicers does not remove the date condition.

The difference is eight orders and 31 units, exactly the August source population W01-W08. This numerical pattern suggests the date restriction, but inspect the actual filter before declaring the cause. A missing source block could create the same totals. Confirm that all eighteen source records exist, then inspect the report's date field and other active mechanisms.

Once the hidden date restriction is removed, the report should return to eighteen orders and 72 units under the unrestricted baseline. If it remains at 41, check whether a second date control, a report filter or a stale cache is involved. Do not delete or reimport the source merely because the visible result has not changed.

A second subtle failure occurs when a report correctly retains the standard September Closed state after a reset. Its twenty units are not evidence of a failed reset if that was the named destination. The problem is a misleading reset label such as Show all. State explicitly whether the operation clears every restriction or restores the standard working selection.

A practical reset checklist should list the mechanisms actually used, not assume one universal clear button covers every object. Confirm category slicers, report filters, label/value/date conditions and formula selectors as applicable, then reconcile the intended baseline. The final numerical check is the evidence that the combined state matches the named population.

Hypothetical state	Orders	Units	Explanation
All slicers, August still excluded	10	41	September 32 plus October 9
Unrestricted after full reset	18	72	All supplied records
Standard September Closed reset	5	20	Intentional monthly/status restrictions remain
September all statuses	9	32	Different legitimate working state

E09-X1 Diagnose the forty-one-unit report

All Site and Service slicers appear clear, but the report shows ten orders and 41 units. Identify the exact omitted source block that fits the difference, state what to inspect, and give the full-reset controls.

Submit: A hypothesis, evidence plan and expected reset result.

10 Verify connections instead of trusting visual proximity

A slicer beside a chart does not necessarily control that chart. It may be connected to one PivotTable and not another, or the two reports may use incompatible sources. If several views are intended to respond together, name the report objects and inspect their connection settings. Visual placement is not a functional dependency.

Create a connection map for a hypothetical native workbook: Site slicer controls SummaryPivot and ServicePivot; Status slicer controls SummaryPivot only; a chart is based on ServicePivot. Under this map, changing Status can alter SummaryPivot while leaving the chart unchanged. That behavior is consistent with the map, though it may not match the reporting intention. The appropriate response is to inspect and correct the intended connections, not assume the chart is stale.

Shared slicer use depends on compatible PivotTable sources. Verify the actual source relationship in the target application before promising that one slicer can connect every report. The supplied formula lab has no native slicer objects and therefore makes no connection claim. Its selectors drive its own helper formulas directly.

Test each connection with a selection that should visibly change the target output. Site=North changes the unrestricted quantity from 72 to 27, making it a useful challenge. A selection that happens to leave a total unchanged cannot prove the connection is working. Use both a positive change test and a return-to-baseline test.

If two reports are intentionally independent, label their scopes separately. There is nothing wrong with one showing all sites while another shows North, provided the distinction is explicit. The danger is a dashboard that looks synchronized while its panels represent different populations. A connection map and visible scope labels prevent that ambiguity.

Hypothetical object	Intended control	Test evidence
SummaryPivot	Site and Status slicers	North/Closed should affect both count and units
ServicePivot	Site slicer	North selection should change service totals
Chart based on ServicePivot	Inherits ServicePivot state	Should follow Site, not an unconnected Status slicer
Formula lab	Control B4:B8 inputs	Included helpers change directly

E10-X1 Review a connection mismatch

A hypothetical SummaryPivot changes when Status=Closed is selected, but the chart based on ServicePivot does not. The Site slicer controls both pivots and Status controls only SummaryPivot. Explain the observed behavior and give a verification plan for a requested synchronized design.

Submit: A connection diagnosis and a concrete test plan.

11 Do not confuse source visibility with report inclusion

Filtering the Source table to North hides other source rows in the worksheet view. It does not delete them from Orders, and a PivotTable based on the whole named table can still include them. Likewise, the supplied formula selectors evaluate the full table regardless of which source rows are visually hidden by AutoFilter. The visible sheet and the analytical population are separate states.

Use SUM(Orders[Units]) for an all-source quantity control. It remains 72 when ordinary source filtering hides South and Remote. A visible-row SUBTOTAL using function number 109 can show 27 for a North-only source view. Both formulas can be correct because they describe different populations. Label them all-source units and visible source units, not two versions of an ambiguous Total.

Manually hidden rows and filtered-out rows can also differ in subtotal behavior depending on the function number. The 101-111 family, including 109 for sum, excludes manually hidden rows as well as filtered-out rows. This is a reason to choose and document the intended function rather than copying a subtotal formula without understanding its visibility rule.

Do not copy only visible rows into a new report source unless the task explicitly requires a new filtered extract. That operation changes the physical population and can lose the ability to restore excluded records from the report. If you create a separate extract for an authorized purpose, label its scope and keep the original source intact. A working filter should normally remain a reversible view.

For native pivot testing, apply the selection at the report controls or deliberately build a filtered-source workflow with clear evidence. Do not assume a source AutoFilter is equivalent to a pivot report filter. The same word filter can refer to different objects and different effects, which is why the mechanism inventory matters.

```
All-source quantity: =SUM(Orders[Units])
Visible-source quantity: =SUBTOTAL(109,Orders[Units])
North-only source visibility: expected 72 all-source, 27 visible.
Formula selector totals depend on Control inputs, not source visibility.
```

12 Distinguish label filters from value filters

A label filter selects categories based on their names, while a value filter selects categories based on an aggregated measure. Site equals North is a label condition. Sites with total Units greater than 22 is a value condition. In the unrestricted case, North has 27, South 23 and Remote 22, so the strict greater-than condition includes North and South only.

A greater-than-or-equal condition would include Remote as well. The difference is not cosmetic: one operator changes the selected population from thirteen orders and fifty units to all eighteen orders and 72 units. Record the exact comparison operator and the measure used. A threshold on count of orders can produce a different result from a threshold on units.

Top-item filters introduce ranking and possible ties. If you ask for the top two sites by Units in this dataset, North and South are unambiguous. If values tie in another dataset, inspect the application's tie behavior and define the intended reporting rule. Do not assume the word top always means exactly a fixed number of displayed categories under every condition.

Value filters can interact with other filters because the aggregate being ranked or compared may be calculated within the current selection. If Status=Closed is active, site totals differ from the unrestricted values. A threshold test should state the complete context in which the aggregation is evaluated. Otherwise a reviewer cannot reproduce why a site appeared or disappeared.

For this course, use simple explicit thresholds as diagnostic exercises rather than building a complex ranking dashboard. The key lesson is that category selection can depend on source labels or on computed values, and the reset must clear either type when returning to an unrestricted report. A clear Site slicer alone does not prove a value filter is absent.

Unrestricted site	Orders	Units	Units > 22?
North	7	27	Yes
South	6	23	Yes
Remote	5	22	No
Selected total	13	50	North and South only

E12-X1 Audit a value-filter threshold

For all supplied records, select sites whose total Units is strictly greater than 22. List selected sites, expected WorkIDs, count and units. Compare with a greater-than-or-equal-to-22 condition.

Submit: Two threshold outcomes with exact scope.

13 Keep blank categories visible without inventing status

W16 has three units and a blank raw Status. The derived StatusLabel Unspecified allows the report to expose that missing classification as a selectable category. This is different from replacing the raw blank with a business status. The source evidence remains visible, and the report can quantify how much activity lacks classification.

An all-status report includes W16, giving eighteen orders and 72 units. A report selecting Open, Closed and Cancelled but excluding Unspecified contains seventeen orders and 69 units. Calling that selection All statuses would be misleading because it omits the missing-status category. The caption should identify the actual included set or disclose the exclusion.

A Closed report excludes W16 because it is not known to be Closed, not because it has zero units or falls outside the date range. It is a South Inspection order opened September 28 with three units. Separating these reasons helps diagnose why a record disappears. A single excluded flag without a reason may be insufficient when several predicates apply.

Do not assume a blank category means not applicable. It can mean missing entry, unknown classification or a deliberate absence, depending on the source contract. Here the contract says not supplied. A real cleanup would require evidence from the source owner before assigning a status. The exercise does not authorize guessing or modifying W16.

A useful report can show the Unspecified category as a data-quality signal without turning the textbook into an unrelated cleanup project. State its count and units, preserve the record and keep its inclusion rule explicit. This prevents a recurring filter from quietly dropping unresolved work every time a user selects the named operational statuses.

StatusLabel	Orders	Units
Closed	11	47
Open	4	17
Cancelled	2	5
Unspecified	1	3
All	18	72

E13-X1 Reconcile the unspecified status

Calculate the all-status total, the named-status-only total and the Unspecified balance. State the correct treatment of W16 under Closed selection and why the raw blank should remain unchanged.

Submit: A status reconciliation and source-preservation decision.

14 Make an exported report carry its selection state

Interactive controls can disappear when a report is copied into a document, printed or exported. A slicer that clearly showed North on screen may not appear in the exported range. The reader then sees a total of 27 without knowing it is a site subset. Put a compact scope statement inside the output region rather than relying only on controls elsewhere on the sheet.

A percentage also needs a visible population definition when filters change. North contributes 27 of the 72 supplied units, or 37.5 percent of the unrestricted source. After selecting North alone, a percentage calculated against the current selected grand total can show 100 percent because both numerator and denominator are 27. These figures answer different questions. Do not relabel the selected-population percentage as contribution to the entire source. If the report promises a fixed-source comparison, keep the 72-unit baseline explicit and separately verified. A clear caption must identify which population supplies the denominator, even when the quantity itself is unchanged. This check belongs in the filter acceptance test because a selection can change the meaning of a ratio without changing its visible format.

A useful scope line names Site, Service, StatusLabel, date interval, measure and freshness observation. For F3 it might say All sites; Setup; Closed; opened September 1 through September 30, 2026; sum of equipment units. Add the actual refresh or calculation observation only if it was performed. Do not stamp a current date and call it refreshed without executing the relevant action.

The phrase Multiple items is not enough for a static export. List the selected items, such as North and South, or attach an explicit selection summary. If the selected set is large, describe a precise rule and provide the full list in an accompanying detail note. The reader needs a reproducible predicate, not merely evidence that some selection occurred.

Distinguish the event interval from the report observation time. OpenedOn describes when each order was opened. A refresh timestamp describes when the report updated from its source. A file creation time describes when the export was produced. These can differ, and none should silently stand in for the others. A recurring report benefits from clear labels for each time it uses.

Before sharing a static output, inspect the exported region itself. Confirm that the title, selection state, count and units remain visible and that no clipped caption hides a restriction. The course does not ask you to send the report to anyone; it asks you to prepare a self-contained result whose meaning survives outside the interactive workbook.

Weak caption	Improved caption	Why
Selected data	South; Repair; Closed; all supplied dates	Names the actual predicate
Multiple items	Sites North and South; Setup; September	Identifies the selected set
Overall total	All 18 supplied orders; 72 units	Bounds the all-source claim

Weak caption	Improved caption	Why
Refreshed today	Actual observed refresh time, or not performed	Separates evidence from a decorative date

E14-X1 Write a static-export scope note

Write a scope note for F3 and one for North-or-South Setup in September with all statuses. Include measure and dates. Leave refresh timing marked not performed unless you have an actual observation.

Submit: Two complete captions.

15 Test repeated use, not only a single successful click

A recurring report is used through sequences of selections. A user may select North, then Setup, then September, then clear only Site. The resulting state is all sites but still Setup and September. If the title changes to Overall activity, it becomes misleading even though the filters are behaving correctly. Sequence tests reveal problems that isolated one-click demonstrations miss.

Use a short state-transition ledger. Start unrestricted at eighteen orders and 72 units. Select Site=North to get seven and 27. Add Service=Setup to get W02, W12 and W18, three orders and fourteen units. Add September to leave W12, one order and three units. Clear Site only, keeping Setup and September, to get W10, W12 and W14, three orders and eleven units. Status remains All throughout this sequence.

The last result is not F3 because F3 also requires Closed. Adding Closed would remove W12 and produce W10/W14, two orders and eight units. This small distinction is a useful test of whether a reset or caption accidentally changes a status condition. Record every retained selection, not only the one just changed.

After the sequence, run the complete unrestricted reset and confirm eighteen/72. Then restore the standard September Closed view and confirm five/twenty if that is the requested handoff state. Both steps should be explicit. Leaving a report in the last test state without saying so creates an avoidable trap for its next user.

A sequence test can be executed with the formula selectors, native controls or both. The expected predicates and values are the same, but the observed mechanics differ. Label the method used and preserve the source. The purpose is to prove that state changes compose predictably and that the final handoff state is intentional.

Step	Retained selection state	Orders	Units
Start	All categories; all supplied dates	18	72
Select North	North; other categories All	7	27
Add Setup	North; Setup; all statuses/dates	3	14

Step	Retained selection state	Orders	Units
Add September	North; Setup; all statuses; September	1	3
Clear Site only	All sites; Setup; all statuses; September	3	11
Add Closed	All sites; Setup; Closed; September	2	8
Full reset	Unrestricted supplied source	18	72

E15-X1 Trace a selection sequence

Reproduce the seven states in the transition table, listing matching IDs for the four intermediate states from North-Setup through all-site Setup Closed September. State the final unrestricted reset controls.

Submit: A state-transition ledger with exact identities.

16 Distinguish freshness, membership and selection defects

Three different problems can produce a wrong report total. The source may lack a record, the report may be stale, or an unintended filter may exclude the record. Diagnose these boundaries separately. If W18 is present in Orders but an unrestricted pivot remains at 63, inspect the pivot source, refresh state and date filters before changing any source data.

A source membership defect is visible before reporting: Orders contains only W01-W17 and sums to 63. A stale report can coexist with a correct eighteen-row source and direct total 72. A date filter ending before October 1 can also show 63 from a current report. The same number therefore does not uniquely identify the cause.

Use a sequence of evidence checks. Confirm the source ID set and all-source controls. Confirm the report references that source. Inspect every active filter and its endpoints. Explicitly refresh the report when appropriate. Then compare the unrestricted count and quantity. This order avoids reimporting a record that is already present or widening a date range when the source itself is incomplete.

Do not describe a refresh as a universal repair. Refreshing a correctly configured report can update a stale cache, but refreshing a fixed source range that omits W18 will still omit it. Clearing filters will not restore a record that is absent from the source. Changing a formula caption will not repair either issue. The action must address the verified boundary.

A concise defect record should identify action, target, observed result and next evidence. For example: Orders has eighteen IDs and 72 units; pivot source ends at row 18, excluding W18 at row 19; correct the source reference to Orders and refresh. That record is actionable because it names the cause rather than merely saying the workbook needs updating.

Observed state	Potential cause	Discriminating evidence
Source 17/63	W18 absent from source	Inspect source IDs
Source 18/72; report 17/63	Stale cache or wrong range or date filter	Source reference, filters and refresh
All slicers; report 10/41	August restriction or missing block	Check source first, then date conditions
Valid predicate; 0/0	No matching records	Expected-ID set and freshness confirmation

17 Implement the selection in a native report deliberately

When using a compatible desktop version of Excel, begin with a new PivotTable based on the named Orders table, not a manually selected visible subset. Put Site in Rows, Service in Columns, Sum of Units in Values and Count of WorkID beside it as a second value. StatusLabel and OpenedOn must be available as report restrictions. This arrangement is a test view, not a required dashboard design. Its purpose is to make category intersections and record counts inspectable.

Confirm the value settings explicitly. Units must be summed, while WorkID must be counted because it is a nonblank unique identifier. A count of Units would count known zero-valued records, but a later blank quantity could change that count. Counting WorkID keeps the record-count measure tied to the declared row grain. Check that all eighteen identifiers are present once before trusting either measure.

Insert controls only for fields whose selection a reader needs to change. Site and StatusLabel slicers can expose their category selections, while Service can remain a clearly labeled report filter. A date restriction may be a report condition or an appropriate date control supported by the application. Whatever mechanism you choose, record its exact bounds and include it in the reset inventory. Do not assume a month label proves the year or endpoints.

Run the unrestricted reconciliation first, then F1, F2 and F3. For F2, the only included order is W03, so the South-Repair intersection should contribute one order and six units. For F3, the Setup column contains South two and Remote six, with one order at each site. North has no matching order in F3. Depending on report display settings, a no-data category can be omitted or shown without a value. Either presentation needs the same membership evidence; it must not create a phantom zero-valued order.

Test the count and quantity together after each change. A total of eight alone does not distinguish F3 from a mistaken one-record selection containing W09, which also has eight units. The correct F3 count is two and the correct IDs are W10 and W14. This is why the report layout includes both measures even if the final presentation later uses only one headline number.

Finally, inspect any chart that is supposed to follow the report. Confirm its source report and scope rather than judging only the color or shape of the graphic. Record the application/version used and the observations you actually made. The supplied workbook provides formula selectors, so creating and testing a native PivotTable, slicer or chart is a separate learner action. If those features are unavailable, retain the source-based expected views and mark native interaction not performed rather than inventing a successful test.

F3 included site	Service	Matching WorkIDs	Count of WorkID	Sum of Units
South	Setup	W10	1	2
Remote	Setup	W14	1	6
Total	Setup	W10,W14	2	8

E17-X1 Specify and reconcile the native test view

Give the source, row/column/value fields, complete F2 and F3 included-record views, and a rule for interpreting a missing North row in F3. Distinguish an expected view from an actually executed native test.

Submit: A field specification and two exact result views.

18 Validate selector inputs before interpreting the result

Dropdown lists reduce accidental input errors, but they do not make the workbook immune to invalid entries. Pasting into a selector can introduce a misspelled category or a blank. A number formatted to look like a date can also be wrong, and a date-looking text string is not the same typed value as a spreadsheet date. Validate the active inputs before displaying a business result.

The formula lab uses Control!B10 as an input-status cell. It first requires two numeric date values in B7:B8. It then requires whole-day values and Start strictly before exclusive End. Finally it checks each category against the supplied allowed list, including All and Unspecified where appropriate. B11 and B12 show the text marker N/A when B10 is not Valid. This marker means the result is unavailable because of input validity, not that an Excel error occurred.

Source!H2:H19 returns zero while the control state is invalid. That keeps a malformed input from producing a partially interpretable selection. The headline results still show N/A rather than zero, so the internal zero flags cannot be mistaken for zero operational activity. B15 repeats the specific input problem; once inputs are valid, it distinguishes matching records from no matches and matching records with zero units.

Consider four controlled changes to a practice copy. Blank B7 must be invalid date input. Text such as September first must also be invalid date input. Equal start and end dates are an invalid date range. Site=Nort is an invalid category. None should be accepted as a valid

zero-result selection. Restore the original cells after each test and confirm the unrestricted eighteen/72 baseline.

Compare those cases with a valid interval from November 1 through December 1, 2026. There are no supplied work orders in that interval, so the result is zero orders and zero units with No matching records. The dates are valid even though the selected population is empty. Input validity and source coverage are different questions; the workbook does not establish that no real work happened outside the supplied extract.

The allowed category lists are part of this practice source contract. A future site named Harbor should not silently be treated as an invalid business location forever. It would require an intentional schema and selector update, supported by the new source. Until that update is made, rejecting an unsupported selector is safer than presenting a misleading no-match result. The lesson is to keep allowed inputs, source categories and user-facing explanations aligned.

```
Control!B10 =IF(COUNT(B7:B8)<>2,"Invalid date input",
 IF(OR(B7<>INT(B7),B8<>INT(B8),B7>=B8),
 "Invalid date range",
 IF(AND(OR(B4="All",B4="North",B4="South",B4="Remote"),
 OR(B5="All",B5="Repair",B5="Setup",B5="Inspection"),
 OR(B6="All",B6="Closed",B6="Open",B6="Cancelled",
 B6="Unspecified")),"Valid","Invalid category")))
Control!B15 =IF(B10<>"Valid",B10,
 IF(B12=0,"No matching records",
 IF(B11=0,"Matching records; zero units","Matching records")))
```

E18-X1 Reject malformed selectors without hiding valid zero results

Starting from unrestricted, test blank Start, text Start, equal Start/End and Site=Nort separately. Then test November 1 inclusive through December 1 exclusive with All categories. State B10, B11, B12 and B15 for each, followed by the restored baseline.

Submit: A six-row input validation ledger.

19 Carry a recurring filter forward without changing its meaning

A monthly report is reused after the source changes. The new period is not merely a new title pasted over an old selection. Advance both date endpoints, inspect all retained category selections and reconcile the new source population before interpreting the result. A September Closed report can legitimately become an October Closed report, but the selection and source coverage must change together in a documented way.

Use W18 as a boundary test without adding any records. In the supplied source, all sites, all services, Closed and October 1 inclusive through November 1 exclusive selects W18 only: one order and nine units. This is an October result for the supplied extract, not evidence of a complete October month. The source contains only one October date. A caption saying Complete October activity would overstate the available evidence.

Now consider a clearly separate proposed update. A source owner supplies synthetic W19, opened October 2, North, Setup, Closed, four units. In a disposable practice copy, append it

once to the source table and extend the helper formulas. The updated source should contain nineteen unique orders and 76 units. The same October Closed predicate should now return W18 and W19, two orders and thirteen units. The supplied starter and original CSV remain unchanged for comparison.

This update tests more than arithmetic. Confirm that the named table includes the appended row, that StatusLabel, Included and IncludedUnits are present for it, and that the native report source and refresh include it if you are using a pivot. A table expansion without helper propagation can omit W19 from the formula lab, while a correct formula lab beside an unrefreshed pivot can produce different outputs. Record which boundary you actually verified.

Selection persistence also deserves a check. If the previous user left Service=Repair, an October Closed report would show no matches even after W19 was added, because both October orders are Setup. That result is correct for the retained Repair predicate but wrong for an intended all-services monthly report. Compare the full selection state with the new report brief rather than assuming only the month needed changing.

After the update test, return to the original source for the final course handoff. Keep the update copy separately labeled with its nineteen/76 source controls if you retain it. Do not merge hypothetical update facts into the original case or overwrite the original CSV. A recurring workflow needs a reproducible relationship among source version, selected period, category restrictions and observed result. The filter alone does not establish completeness or freshness.

Scenario	Source control	October Closed members	Orders	Units
Supplied source	18 orders / 72 units	W18	1	9
Separate update copy with W19	19 orders / 76 units	W18,W19	2	13
Updated copy; Repair accidentally retained	19 orders / 76 units	None	0	0

E19-X1 Specify the October rollover and update test

Using the supplied source, specify the October Closed state and expected IDs/count/units. Then predict the separate W19 update-copy result and the outcome if Repair remains selected. Give source controls and the checks required before calling the updated report current.

Submit: Three exact states and an update verification plan.

20 Design a maintainable handoff state

A recurring report should open in an intentional state. For this case, the final working handoff is the standard September Closed view: all sites, all services, Closed status, September 1 inclusive through October 1 exclusive. It should display W09, W10, W11, W14 and W17, five orders and twenty units. The unrestricted source controls remain eighteen and 72 alongside it.

The supplied starter opens unrestricted so that learners can establish the baseline first. Your completed practice copy may end in the stated standard view after all tests. Record that difference clearly. A reviewer should not assume a twenty-unit opening view is a defect when the caption says September Closed, nor accept an unlabeled twenty as an overall total.

Include two reset instructions: Restore unrestricted supplied source and Restore standard September Closed. Each instruction should identify the controls or input cells involved and the expected count/quantity. Avoid a vague instruction to click Clear until it looks right. The expected result is a testable destination, not a visual impression.

Keep source protection separate from filter convenience. Filtering is not a security boundary, and hidden rows can still exist in the workbook. This course uses wholly synthetic records, so no access-control system is needed. In a real report, do not rely on filters to prevent a recipient from accessing excluded data. Sharing and permissions require their own appropriate controls.

The handoff should also distinguish completed observations from pending native tests. A formula-selector workbook can be fully useful for predicate practice even when native slicer connections were not tested. Label that scope accurately and provide the intended native test procedure. Clear limits are better than a claim that every interactive feature works when only arithmetic was checked.

Final standard-view member	Site	Service	Units
W09	North	Repair	8
W10	South	Setup	2
W11	Remote	Inspection	0
W14	Remote	Setup	6
W17	Remote	Repair	4
Total	All sites	Closed September	20

E20-X1 Deliver a safe recurring report

Provide the source-preserving workbook, mechanism inventory, F1-F3 results, zero/no-match tests, hidden-date diagnosis, sequence test and final standard-view scope. Include unrestricted reset controls and a truthful record of native features actually tested.

Submit: A workbook and concise acceptance record.

Assessment

Choose one best answer per question. Questions 1–10 check the foundation concepts; questions 11–20 apply the extended study units. Complete and submit the practical tasks separately. A strong quiz score does not replace correct practical work.

1. Selecting Design and Guide in the foundation report includes which records?

A. Records matching either selection

B. Every Guide record regardless of department

C. Every Design record regardless of resource type

D. Records matching both selections

2. What does a visible slicer establish by itself?

A. That refresh succeeded

B. Its own current selection state

C. That every other filter is clear

D. That the source is complete

3. Foundation F1 selects all Design receipts. What quantity should it show?

A. 24

B. 27

C. 51

D. 15

4. Foundation F2 selects Support and Guide with all dates. What quantity is correct?

A. 9

B. 27

C. 24

D. 3

5. Foundation F3 selects Template during February 2026. What quantity is correct?

A. 7

B. 27

C. 17

D. 24

6. Foundation slicers show all categories but the total is 42 instead of 51. What is the relevant next inspection?

A. Assume the nine-unit difference means source rows were deleted

B. Refresh repeatedly without inspecting retained conditions

C. Rebuild the report from only its currently visible records

D. Other mechanisms, especially the inherited date filter

7. Which static caption preserves a Support-Guide selection most clearly?

A. Multiple items

B. Selected data

C. Support; Guide; all supplied dates; actual refresh observation stated

D. Overall usage

8. A nearby slicer does not change a second pivot. What should be checked?

A. Clear the first slicer and assume all reports reset together

B. Report connections and source compatibility

C. Refresh the second pivot repeatedly without checking its connections

D. Recreate the chart from the unchanged second pivot

9. Why reset between independent filter tests?

A. To prevent earlier selections from changing the next predicate

B. To avoid checking which fields remain restricted

C. To guarantee every test returns the unrestricted total

D. To preserve every earlier restriction as an additional test condition

10. No source records match a valid verified selection. What is appropriate?

A. Keep changing filters until records appear without updating the caption

B. Assume refresh failed

C. Report zero usage for the entire source

D. Say no matching records for the stated selection

11. What distinguishes the unrestricted Linden view from the standard September Closed view?

A. The standard view deletes cancelled records

B. They are two names for the same reset

C. The unrestricted view is 18/72; the standard view is 5/20

D. The standard view must include October 1

12. Which records match South Repair Closed over all supplied dates?

A. All South records

B. W03 only

C. W13 only

D. W03 and W13

13. Remote Inspection Closed in September returns one order and zero units. What does that mean?

A. Refresh failed

B. Invalid date range

C. No matching records

D. W11 is a matching recorded zero-unit order

14. All category slicers are clear and the only remaining restriction excludes August. What result fits?

A. 10 orders, 41 units

B. 5 orders, 20 units

C. 9 orders, 32 units

D. 18 orders, 72 units

15. What is the safe treatment of W16 blank Status?

A. Assume Closed

B. Preserve the raw blank and expose Unspecified as a derived label

C. Delete the order from all reports

D. Assume Open

16. Which selection means (North OR South) AND Setup AND September?

A. Only W14

B. Every North order plus South Setup

C. W10 and W12, five units

D. W02, W10, W12 and W18

17. A strict site-total Units > 22 filter includes which sites?

A. All three sites

B. Remote only

C. North and South

D. North only

18. After North, Setup and September are selected, clearing Site alone should show what?

A. Setup in September across sites, 3 orders and 11 units

B. Only Closed Setup, 2 orders and 8 units

C. All 18 source orders

D. All September services, 9 orders and 32 units

19. Does filtering source-table visibility to North necessarily filter a pivot built from the complete named table?

A. No, because a pivot must be rebuilt to change any selection

B. No; source visibility and report inclusion must be tested separately

C. Yes, visibility always defines the pivot source

D. Yes, refreshing always makes a pivot use only currently visible source rows

20. Which state is invalid input rather than a valid no-match result?

A. A valid selection with zero matching IDs

B. A subset with fewer records than the source

C. A valid zero-unit matching order

D. A start date on or after the exclusive end date

Sources and further reading

Use slicers to filter data
https://support.microsoft.com/en-us/office/use-slicers-to-filter-data-3517fa12-353e-4907-b94d-b8e9b500ee33

Show different calculations in PivotTable value fields
https://support.microsoft.com/en-us/excel/show-different-calculations-in-pivottable-value-fields

Filter data in a PivotTable
https://support.microsoft.com/en-us/excel/get-started/filter-data-in-a-pivottable

Use slicers to filter data
https://support.microsoft.com/en-us/excel/get-started/use-slicers-to-filter-data

SUBTOTAL function
https://support.microsoft.com/en-us/excel/functions/subtotal-function

Refresh PivotTable data
https://support.microsoft.com/en-us/excel/refresh-pivottable-data