

Abbreviations and acronyms:

-When provided on the Formula/Conversion Table or otherwise commonly understood, abbreviations are preferred to either writing out the term or providing both the abbreviation and term, especially above Class I; for example, simply write “DO” rather than “dissolved oxygen” or “dissolved oxygen (DO)”

-If an acronym is emerging, or if use of the full term vs the acronym varies by workplace, provide both

-If an acronym is less commonplace than the full term, or if the acronym is also used to signify something else and could be confused in the context of your statement, use only the term

-In addition to the Formula/Conversion Table values, the following abbreviations have previously been identified as able to stand on their own:

ABS	DPD	HTH	NPSHr	PVC	SSO	TP
AED	EPS	LEL	NTU	SBR	SUVA	TTC
CCTV	ERP	MIB	O&M	SCADA	TDS	TTHM
CFU	GAC	MMO-MUG	OEM	SCBA	THM	UV
CIPP	GFCI	MPN	PAC	SDR	TKN	VA
CMOM	GHS	mV	pcu	SDS	TLVWA	VFDs
CSO	GIS	NOM	PE*	SMP	TMP	VOCs
CT	HDPE	NPSHa	PLC	SOP	TN	

**when referring to “polyethylene” in a context that can’t be confused with “population equivalent” (which is provided on the Formula/Conversion Table)*

-Instead of the following or similar abbreviations, use the unit expressions:

Abbreviation	Unit Expression
fps	ft/sec
mps	m/sec
gps	gal/sec
Lps	L/sec
cfs	ft ³ /sec

-Unacceptable abbreviations include:

Unacceptable	Use Instead
million gal	MG
million L	ML
s	sec
mi	miles
y	yr

Capitalization/italics:

-Capitalize BEST, FIRST, MOST, LEAST, NOT, etc.

-Response options are not initially capitalized unless they are sentences

-For binomial nomenclature of organisms, follow the standard method for writing genus and species: genus is initially capitalized and both words are italicized (e.g., *E. coli*)

Commas and periods:

-Always use the serial comma/Oxford comma (e.g., instead of “apples, oranges and bananas” write “apples, oranges, and bananas”)

-Response options should end in periods when (and only when) the response option is a complete sentence in and of itself, or when the response option completes a sentence started in the stem

Spacing/alignment/lists:

-When there is a column of numbers, align by the unit (or where the unit would appear), **not** by the decimal

-For temperature, do not put a space between the number, degree symbol, and unit (e.g. 5°C)

-For lists of facts/data points, unless it will cause confusion, simply start each item on a new line – do not use bullets, dashes, indents, etc.; in some cases, it may be appropriate to provide data in a table format

Jurisdictional concerns:

-Content must be written without bias to any jurisdiction (i.e., the US or Canada)

-No item may reference, include, or test on a regulation or standard applicable to one country; jurisdictional authorities like EPA, OSHA, and National Bureau of Standards should not be mentioned in an item, even as a distractor

-Avoid terms with subtle biases (e.g., AWWA, or “gallon container” when “container” will suffice)

-Terms like the following should appear in pairs, or not at all: “state or province,” and “ordinance or bylaw”

-Numeric values and response options should generally be provided in both US customary units and metric; there are some global standards that will be exceptions (e.g., laboratory topics will generally reference metric only)

Graphics:

-If numeric values are included, both US customary values/units and metric values/units generally need to be provided

Numbers and units:

-Use units as indicated on Formula/Conversion Table

-Unit expressions should be used rather than acronyms (e.g., use "ft³/sec" rather than "cfs")

- US customary values and units appear first, followed by metric values and units in parentheses

-Decimal numbers less than one must have a leading zero (e.g., use "0.1", **not** ".1")

-Do **not** add zeros to the right of a decimal point simply to make numbers in a list, column, or item the same number of digits or decimal places (e.g., leave 1.1 and 2.22 as they are rather than change to 1.10 and 2.22)

Calculations:

-For items that require calculation, the complete step-by-step calculations should be written out for **both** US customary units and metric in the Feedback field (do not just convert the values from US customary units to metric). It is important to update these steps in the feedback field when updates are made to the item. The calculations should include leading zeroes and units.

- **Rounding practices**

- Maximum of 2 decimal places (unless there is a compelling reason to go further for the specific item)
- Limit precision of weights/measures given in stem to what's necessary (don't need to add 0s)
- Round only at the END of the entire calculation, NOT throughout/at each step
- Always round 5 up
- Significant digits: no need to enforce, but stay aware (make sure using the methodology wouldn't favor a distractor over the key)

- **Things to avoid**

- Adding an extra step for one system of measure vs the other (e.g., don't use a combination of ft and yds for US, but only give m for metric)
- Items that require simple calculations for which the conversion is provided on the Formula/Conversion Table
- Identifying an item as a "calculation" if the correct answer can be discerned without completing the calculation (e.g., if general understanding of a concept will lead one to conclude that the largest answer is best)

- Utilizing values that enable a candidate to choose the wrong formula or to skip a step but still get a right answer (e.g., radius of 2 enables candidate to get away with mistake of using the diameter rather than squaring the radius; expecting the candidate to subtract a value that is too insignificant won't indicate whether or not the candidate completed the step)
- **Methodology to develop & validate calculation items**
 1. Use nominal sizes/measures rather than precise measurements for pipes, etc.
 2. Must be precise to the formula/conversion table – ALL formulas and values must match those provided on the FCT (e.g., pi = 3.14 – don't use the pi symbol on your calculator)
 3. Work US calculation beginning to end (document formula and step-by-step work – save in LXR Feedback field)
 4. Work metric calculation beginning to end (document formula and step-by-step work – save in LXR Feedback field)
 5. Check the conversion between the US and metric values in the key – they should not be so different as to be alarming to the test taker (also, be wary of the degree of US-metric differences between the key and distractors to ensure that the variance does not clue the key)
 6. Ensure all distractors are distracting to both US and metric users

Spelling and hyphenation of words:

-The following sets of homophones and near-homophones are often found to be misused in test items:

- **Absorb** (*soak up*) vs. **adsorb** (*collect condensed gas on a surface*)
- **Affect** (*to influence*) vs. **effect** (*the result*)
- **Assure** (*remove someone's doubts*) vs. **ensure** (*make sure/guarantee something happens*) vs. **insure** (*cover with insurance policy*)
- **Awhile** (*adverb – for a short time*) vs. **a while** (*noun – a period of time*)
- **Farther** (*indicates a physical distance*) vs. **further** (*figurative, nonphysical distances*)

-The following words are often found misspelled or mis-punctuated in test items:

Correct	Incorrect
Absorption	Absorbtion
Backpressure	Back-pressure Back pressure
Backpulse	Back pulse
Backsiphonage	Back-siphonage Back siphonage
Bisulfate	Bi-sulfate
Cast iron	Cast-iron
C-factor	C factor
Dead end	Dead-end

Diphtheria	Diphtheria
Drawdown	Draw down Draw-down
<i>E. coli</i>	Ecoli ecoli
Off gas	Off-gas
Ohmmeter	Ohm meter
Over-lubricate/over-lubrication	Overlubricate/overlubrication Over lubricate/over lubrication
Over-rotate	Overrotate Over rotate
Palmer-Bowlus	Palmer Bowlus palmer bowlus palmer-bowlus
Self-contained breathing apparatus	Self contained breathing apparatus
V-notch weir	Vnotch weir V notch weir
Waste stream	Wastestream

-US spelling will be utilized; some common discrepancies include:

US Spelling (Use)	Alternate Spelling (Do Not Use)
Behavior	Behaviour
Caliber	Calibre
Catalog	Catalogue
Center	Centre
Centimeter	Centimetre
Check	Cheque
Color	Colour
Defense	Defence
Dependent	Dependant
Dialog	Dialogue
Endeavor	Endeavour
Favor	Favour
Fiber	Fibre
Gauge	Gage
Gray	Grey
Kilometer	Kilometre
Labor	Labour
Liter	Litre
License	Licence
Meter	Metre
Odor	Odour
Sulfur	Sulphur
Tons	Tonnes