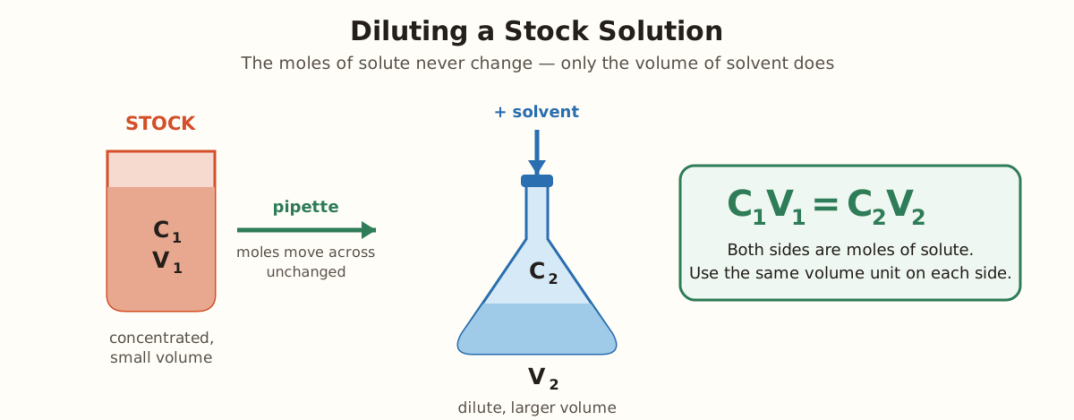
Dilution Worksheet

Grade 11 Chemistry · $C_1V_1 = C_2V_2$

Name: Date: Score: / 20



Before you start: both volumes must be in the same unit before you divide. Several questions below deliberately mix millilitres and litres — convert first, then substitute. Give every answer to three significant figures.

Part A · the idea in one line

1. Diluting a solution changes its _____ but not the number of _____ of solute.
2. In $C_1V_1 = C_2V_2$, subscript 1 is the _____ solution and 2 is the _____ one.

Part B · find the diluted concentration

#	Given	Find	Answer
1	C_1 = 2.00 mol/L, V_1 = 50.0 mL, V_2 = 250.0 mL	C_2 =	
2	C_1 = 6.00 mol/L, V_1 = 25.0 mL, V_2 = 500.0 mL	C_2 =	
3	C_1 = 0.500 mol/L, V_1 = 100.0 mL, V_2 = 250.0 mL	C_2 =	
4	C_1 = 12.0 mol/L, V_1 = 15.0 mL, V_2 = 1.20 L	C_2 =	
5	C_1 = 1.50 mol/L, V_1 = 40.0 mL, V_2 = 200.0 mL	C_2 =	
6	C_1 = 18.0 mol/L, V_1 = 10.0 mL, V_2 = 2.00 L	C_2 =	

Part C · how much stock do you need?

#	Given	Find	Answer
7	C_1 = 5.00 mol/L, C_2 = 0.250 mol/L, V_2 = 500.0 mL	V_1 =	
8	C_1 = 12.0 mol/L, C_2 = 1.50 mol/L, V_2 = 250.0 mL	V_1 =	

#	Given	Find	Answer
9	C_1 = 0.800 mol/L, C_2 = 0.100 mol/L, V_2 = 2.00 L	V_1 =	
10	C_1 = 16.0 mol/L, C_2 = 0.400 mol/L, V_2 = 750.0 mL	V_1 =	
11	C_1 = 3.00 mol/L, C_2 = 0.750 mol/L, V_2 = 1.00 L	V_1 =	
12	C_1 = 10.0 mol/L, C_2 = 2.50 mol/L, V_2 = 80.0 mL	V_1 =	

Part D · what final volume? then state the solvent added

#	Given	Find	Answer
13	C_1 = 4.00 mol/L, V_1 = 30.0 mL, C_2 = 0.600 mol/L	V_2 =	
14	C_1 = 2.50 mol/L, V_1 = 60.0 mL, C_2 = 0.250 mol/L	V_2 =	
15	C_1 = 15.0 mol/L, V_1 = 20.0 mL, C_2 = 0.500 mol/L	V_2 =	
16	C_1 = 0.900 mol/L, V_1 = 150.0 mL, C_2 = 0.300 mol/L	V_2 =	

Part E · the stock concentration was not recorded

#	Given	Find	Answer
17	V_1 = 25.0 mL, C_2 = 0.360 mol/L, V_2 = 125.0 mL	C_1 =	
18	V_1 = 40.0 mL, C_2 = 0.150 mol/L, V_2 = 500.0 mL	C_1 =	

Answer Key

Dilution · Grade 11 Chemistry

Part A

1. **concentration**; **moles**
2. **concentrated** (stock); **dilute** (final)

Parts B to E · substitution shown before the arithmetic

#	Working	Answer
1	$C_2 = C_1V_1 / V_2$ = (2.00)(50.0 mL) / (250.0 mL)	**0.400 mol/L** · solvent added 200 mL
2	$C_2 = C_1V_1 / V_2$ = (6.00)(25.0 mL) / (500.0 mL)	**0.300 mol/L** · solvent added 475 mL
3	$C_2 = C_1V_1 / V_2$ = (0.500)(100.0 mL) / (250.0 mL)	**0.200 mol/L** · solvent added 150 mL
4	$C_2 = C_1V_1 / V_2$ = (12.0)(15.0 mL) / (1.20 L) · convert first: the two volumes are in different units	**0.150 mol/L** · solvent added 1180 mL
5	$C_2 = C_1V_1 / V_2$ = (1.50)(40.0 mL) / (200.0 mL)	**0.300 mol/L** · solvent added 160 mL
6	$C_2 = C_1V_1 / V_2$ = (18.0)(10.0 mL) / (2.00 L) · convert first: the two volumes are in different units	**0.0900 mol/L** · solvent added 1990 mL
7	$V_1 = C_2V_2 / C_1$ = (0.250)(500.0 mL) / (5.00)	**25.0 mL** · solvent added 475 mL
8	$V_1 = C_2V_2 / C_1$ = (1.50)(250.0 mL) / (12.0)	**31.2 mL** · solvent added 219 mL
9	$V_1 = C_2V_2 / C_1$ = (0.100)(2.00 L) / (0.800) · convert first: the two volumes are in different units	**250 mL** · solvent added 1750 mL
10	$V_1 = C_2V_2 / C_1$ = (0.400)(750.0 mL) / (16.0)	**18.8 mL** · solvent added 731 mL
11	$V_1 = C_2V_2 / C_1$ = (0.750)(1.00 L) / (3.00) · convert first: the two volumes are in different units	**250 mL** · solvent added 750 mL
12	$V_1 = C_2V_2 / C_1$ = (2.50)(80.0 mL) / (10.0)	**20.0 mL** · solvent added 60.0 mL
13	$V_2 = C_1V_1 / C_2$ = (4.00)(30.0 mL) / (0.600)	**200 mL** · solvent added 170 mL
14	$V_2 = C_1V_1 / C_2$ = (2.50)(60.0 mL) / (0.250)	**600 mL** · solvent added 540 mL
15	$V_2 = C_1V_1 / C_2$ = (15.0)(20.0 mL) / (0.500)	**600 mL** · solvent added 580 mL
16	$V_2 = C_1V_1 / C_2$ = (0.900)(150.0 mL) / (0.300)	**450 mL** · solvent added 300 mL
17	$C_1 = C_2V_2 / V_1$ = (0.360)(125.0 mL) / (25.0 mL)	

#	Working	Answer
		1.80 mol/L · solvent added 100 mL
18	$C_1 = C_2V_2 / V_1$ = (0.150)(500.0 mL) / (40.0 mL)	**1.88 mol/L** · solvent added 460 mL