Example of Amortization Schedule for a Note with Equal Total Payments

The following example is based on information from Exercise 14-14 in your textbook. This problem is assigned as Question 1 in Connect.

Problem Data:

On January 1, 2009, American Eagle borrows $90,000 cash by signing a four-year, 5% installment note. The note requires four equal total payments of accrued interest and principal on December 31 of each year from 2009 through 2012.

Requirements:

1. Compute the amount of each of the four equal total payments using the present value table B.3.
2. Prepare an amortization schedule for the installment note.

Before proceeding, click below for a printable copy of the example so that you can work along with the presentation.

Print the Problem and Schedule
(Allow blocked content to display.)

Compute the Equal Total Payments

Using Table B.3, find the present value factor for four years at 5% interest (from problem data) by reading across from the period and down from the rate.

$$p = \left[1 - \frac{1}{(1 + i)^n}\right]/i$$

Table B.3

Present Value of an Annuity of 1

Periods	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	15%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8696
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6257
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.2832
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.8550
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.3522
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.7845
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.1604
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.4873
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.7716
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.0188
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.2337
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.4206
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.5831
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	5.7245
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	5.8474
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	5.9542
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.0472
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.1280
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.1982
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.2593
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.4641
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	6.5660
35	29.4086	24.9986	21.4872	18.6646	16.3742	14.4982	12.9477	11.6546	10.5668	9.6442	8.1755	6.6166
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	6.6418

4

Compute the Equal Total Payments

Using Table B.3, find the present value factor for four years at 9% interest
(from problem data) by reading across from the period and down from the rate.

$$p = \left[1 - \frac{1}{(1 + i)^n}\right]/i$$

Table B.3

Present Value of an Annuity of 1

Periods	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	15%
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16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	5.9542
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25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.4641
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	6.5660
35	29.4086	24.9986	21.4872	18.6646	16.3742	14.4982	12.9477	11.6546	10.5668	9.6442	8.1755	6.6166
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	6.6418

Compute the Equal Total Payments

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9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.7716
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.0188
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.2337
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.4206
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14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	5.7245
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	5.8474
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	5.9542
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.0472
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.1280
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.1982
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.2593
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.4641
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	6.5660
35	29.4086	24.9986	21.4872	18.6646	16.3742	14.4982	12.9477	11.6546	10.5668	9.6442	8.1755	6.6166
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	6.6418

6

Compute the Equal Total Payments

The note payment is computed by dividing the principal by the present value factor.

Principal: $90,000 / PV Factor: 3.5460 =
Payment: $25,381 (rounded to the nearest whole dollar)

Complete the Amortization Schedule

| Period Ending Date | Beginning Balance | Payments | | | Ending Balance |
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ _____	$ _____	$ _____	$ _____	$ _____
2010	_____	_____	_____	_____	_____
2011	_____	_____	_____	_____	_____
2012	_____	_____	_____	_____	_____
		$ _____	$ _____	$ _____	

Complete the Amortization Schedule

•**Enter the principal in the Beginning Balance blank.**

| Period Ending Date | Beginning Balance | Payments | | | Ending Balance |
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ **90,000**	$	$	$	$
2010					
2011					
2012					
		$	$	$	

Complete the Amortization Schedule

•Enter the principal in the Beginning Balance blank.

•**Calculate Interest Expense by multiplying the beginning balance by the interest rate stated on the note ($90,000 X .05)**

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ **4,500**	$	$	$
2010					
2011					
2012					
		$	$	$	

Complete the Amortization Schedule

- Enter the principal in the Beginning Balance blank.
- Calculate Interest Expense by multiplying the beginning balance by the interest rate stated on the note ($90,000 X .05)
- **Enter the equal total payment amount in the Credit Cash blank (calculated in Slide 7.)**

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$	$ 25,381	$
2010					
2011					
2012					
		$	$	$	

Complete the Amortization Schedule

1. Enter the principal in the Beginning Balance blank.
2. Calculate Interest Expense by multiplying the beginning balance by the interest rate stated on the note ($90,000 X .05)
3. Enter the equal total payment amount in the Credit Cash blank.
4. **Determine the amount of principal reduction to be debited to Notes Payable by finding the difference between the cash payment and the amount charged to interest ($25,381 - $4,500).**

| Period Ending Date | Beginning Balance | Payments | | | Ending Balance |
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$
2010					
2011					
2012					
		$	$	$	

Complete the Amortization Schedule

1. Enter the principal in the Beginning Balance blank.
2. Calculate Interest Expense by multiplying the beginning balance by the interest rate stated on the note ($90,000 X .05)
3. Enter the equal total payment amount in the Credit Cash blank.
4. Determine the amount of principal reduction to be debited to Notes Payable by finding the difference between the cash payment and the amount charged to interest ($25,381 - $4,500).
5. **Calculate the Ending (principal) Balance as Beginning Balance less the principal reduction debited to Notes Payable ($90,000 - $20,881) and place the ending balance for this period in the Beginning Balance blank for the next period.**

| Period Ending Date | Beginning Balance | Payments | | | Ending Balance |
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119				
2011					
2012					
		$	$	$	

Complete the Amortization Schedule

1. Enter the principal in the Beginning Balance blank.
2. Calculate Interest Expense by multiplying the beginning balance by the interest rate stated on the note ($90,000 X .05)
3. Enter the equal total payment amount in the Credit Cash blank.
4. Determine the amount of principal reduction to be debited to Notes Payable by finding the difference between the cash payment and the amount charged to interest ($25,381 - $4,500).
5. Calculate the Ending (principal) Balance as Beginning Balance less the principal reduction debited to Notes Payable ($90,000 - $20,881) and place the ending balance for this period in the Beginning Balance blank for the next period.
6. **Repeat steps 2-5 through year 2011.**

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119				
2011					
2012					
		$	$	$	

Complete the Amortization Schedule

See if you can complete the note amortization schedule through **year 2011** on the problem sheet you printed. Round your interest expense to the nearest whole dollar.

Check your answers on the following slide.

Complete the Amortization Schedule

Check Your Answer

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173				
		$	$	$	

Except for the beginning balance which was brought forward from the previous year, the last year has been left intentionally blank.
Continue the presentation to complete the last year.

The Last year

The last year may present a small challenge. First note that the ending balance in the last year should be $0 (you should neither owe money at the end of the loan nor should the bank owe you any money).

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173				
		$	$	$	

The Last year

The last year may present a small challenge. First note that the ending balance in the last year should be $0 (you should neither owe money at the end of the loan nor should the bank owe you any money).

To complete the schedule for the last year, first, enter the ending balance as $0.

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173				0
		$	$	$	

The Last year

Next, enter the cash payment which will be the same as every other period.

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173			**25,981**	0
		$	$	$	

The Last year

Since the balance of the loan should equal $0, the amount debited to Notes Payable in the last year should equal the remaining balance—If at the beginning of the last year you owed a balance of $24,173 (as shown below), in order to pay off the loan by the end of the year you would have to pay $24,173.

Enter this amount in the Debit Notes Payable column.

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173		**24,173**	25,381	0
		$	$	$	

The Last year

Finally, enter the interest expense as the difference between the cash payment and the reduction in the liability (Notes Payable). Note that this amount is plugged and may not equal interest as previously calculated. The difference between the cash payment and the amount debited to Notes Payable is $1,208 ($25,381 - $24173).

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173	**1,208**	24,173	25,381	0
		$	$	$	

Total the Schedule

The last step is to total the columns indicated on the schedule.

Do you notice anything about the total of the Debit Notes Payable column? **If you followed the steps correctly, the total of the Notes Payable column will balance to the principal of the loan.** You borrowed $90,000 and at the end of the four years you have paid back a total of $90,000. You may say that you have paid back $101,524 since that is the total of the Cash column. However, the principal payment is $90,000. The additional $11,524 represents the cost of borrowing money – *Interest*.

Period Ending Date	Beginning Balance	Payments		Credit Cash	Ending Balance
		Debit Interest Expense	Debit Notes Payable		
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173	1,208	24,173	25,381	0
		$ 11,524	$ 90,000	$ 101,524	

Journal Entries

Though not part of the requirements for this problem, to complete this process, we should discuss journalizing the loan payments. This requirement is covered in Exercise 14-15, Question 2 in Connect.

Use the Loan Amortization Schedule to help you make the necessary journal entries each period. Note that the column headings tell you what to do. Simply fill in the amounts for each period using the numbers you calculated in the schedule.

Journal Entries

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173	1,208	24,173	25,381	0
		$ 11,524	$ 90,000	$ 101,524	

Date	Explanation	Debit	Credit
2009 Dec 31	Interest Expense	4,500	
	Notes Payable	20,881	
	Cash		25,381

Journal Entries

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173	1,208	24,173	25,381	0
		$ 11,524	$ 90,000	$ 101,524	

Date	Explanation	Debit	Credit
2009 Dec 31	Interest Expense	4,500	
	Notes Payable	20,881	
	Cash		25,381

Now you complete the entry for 2010 and check your answer on the next slide.

Journal Entries

Period Ending Date	Beginning Balance	Payments			Ending Balance
		Debit Interest Expense	Debit Notes Payable	Credit Cash	
2009	$ 90,000	$ 4,500	$ 20,881	$ 25,381	$ 69,119
2010	69,119	3,456	21,925	25,381	47,194
2011	47,194	2,360	23,021	25,381	24,173
2012	24,173	1,208	24,173	25,381	0
		$ 11,524	$ 90,000	$ 101,524	

Date	Explanation	Debit	Credit
2010 Dec 31	Interest Expense	3,456	
	Notes Payable	21,925	
	Cash		25,381

Complete Exercise 14-14

You should now be ready to complete Exercises 14-14 and 14-15 and Problem 14-8 in Connect.