◆ *Homework Check:* **Lesson 6 - 5**

◆ *Note:* **Amortization Tables**

     A mortgage or loan of any type is amortized when both the principal and interest are paid off with a series of regular, equal payments. An amortization table analyses how the loan is repaid by showing the breakdown with each payment made, the amount of interest paid and the amount of principal paid to the lender. For example, take into consideration the following amortization table for a $2500 loan paid out over 2 years, with a monthly payment and interest of 6.9% compounded monthly.

Loan		
Amount	2500	
Interest Rate	6.90%	
Years	2	
Payments	$111.82	

http://www.wikihow.com/Prepare-Amortization-Schedule-in-Excel

Period	Beginning Balance	Payment	Principal	Interest	Cumulative Principal	Cumulative Interest	Ending Balance
1	2500	$111.82	$97.44	14.375			$2,402.56
2	$2,402.56	$111.82	$98.00	13.81	$98.00	$13.81	$2,304.55
3	$2,304.55	$111.82	$98.57	13.25	$196.57	$111.25	$2,205.99
4	$2,205.99	$111.82	$99.13	12.68	$295.70	$209.25	$2,106.85
5	$2,106.85	$111.82	$99.70	12.11	$395.41	$307.82	$2,007.15
6	$2,007.15	$111.82	$100.28	11.54	$495.68	$406.95	$1,906.87
7	$1,906.87	$111.82	$100.85	10.96	$596.54	$506.65	$1,806.02
8	$1,806.02	$111.82	$101.43	10.38	$697.97	$606.92	$1,704.58
9	$1,704.58	$111.82	$102.02	9.80	$799.99	$707.77	$1,602.57
10	$1,602.57	$111.82	$102.60	9.21	$902.59	$809.20	$1,499.96
11	$1,499.96	$111.82	$103.19	8.62	$1,005.79	$911.22	$1,396.77
12	**$1,396.77**	**$111.82**	**$103.79**	**8.03**	**$1,109.57**	**$1,013.82**	**$1,292.98**
13	$1,292.98	$111.82	$104.38	7.43	$1,213.96	$1,117.01	$1,188.60
14	$1,188.60	$111.82	$104.98	6.83	$1,318.94	$1,220.79	$1,083.62
15	$1,083.62	$111.82	$105.59	6.23	$1,424.53	$1,325.17	$978.03
16	$978.03	$111.82	$106.19	5.62	$1,530.72	$1,430.15	$871.84
17	$871.84	$111.82	$106.81	5.01	$1,637.53	$1,535.73	$765.03
18	$765.03	$111.82	$107.42	4.40	$1,744.95	$1,641.93	$657.61
19	$657.61	$111.82	$108.04	3.78	$1,852.98	$1,748.73	$549.57
20	$549.57	$111.82	$108.66	3.16	$1,961.64	$1,856.14	$440.92
21	$440.92	$111.82	$109.28	2.54	$2,070.92	$1,964.18	$331.63
22	$331.63	$111.82	$109.91	1.91	$2,180.83	$2,072.83	$221.72
23	$221.72	$111.82	$110.54	1.27	$2,291.38	$2,182.11	$111.18
24	**$111.18**	**$111.82**	**$111.18**	**0.64**	**$2,402.56**	**$2,292.02**	**($0.00)**

What do you notice about the interest payments when compared to the principal payments as time progresses?

What do you notice about the totals at the bottom of each column?

It is important to note that as the initial amount of the loan increases, the initial amount of the interest also increases. When a home owner buys a house, an amortization table begins as follows:

Period	Beginning Balance	Payment	Principal	Interest	Cumulative Principal	Cumulative Interest	Ending Balance
1	200000	$1,001.25	$417.91	583.33			$199,582.09
2	$199,582.09	$1,001.25	$419.13	582.11	$419.13	$582.11	$199,162.95
3	$199,162.95	$1,001.25	$420.36	580.89	$839.49	$1,000.02	$198,742.60
4	$198,742.60	$1,001.25	$421.58	579.67	$1,261.07	$1,419.15	$198,321.02
5	$198,321.02	$1,001.25	$422.81	578.44	$1,683.88	$1,839.51	$197,898.21

Notice in this table, the interest is more than the principal by more than $100 in the first payments. This continues for the first 5 years in this particular mortgage although the discrepancy does begin to even itself out and the interest and principal payment become more equal.

Period	Beginning Balance	Payment	Principal	Interest	Cumulative Principal	Cumulative Interest	Ending Balance
60	**$173,137.07**	**$1,001.25**	**$496.26**	**504.98**	**$26,941.28**	**$26,950.00**	**$172,640.81**
61	$172,640.81	$1,001.25	$497.71	503.54	$27,438.99	$27,444.81	$172,143.10
62	$172,143.10	$1,001.25	$499.16	502.08	$27,938.15	$27,941.07	$171,643.93
63	$171,643.93	$1,001.25	$500.62	500.63	$28,438.77	$28,438.78	$171,143.31

Consumers are often unaware of these details when buying a home. Of course, bankers will often approach consumers to re-evaluate interest rates and payment options several times over the years. Consumers may be able to find better options and increase their payment in order to pay less interest over the life of the mortgage as their work situations improve.

◆ *Homework:* __Lesson 6 -6__

Lesson 6 – 6:

1. Given the amortization table below, answer the following questions.

Period	Starting Balance	Interest	Deposit	Ending Balance
1	0.00	0.00	$250.00	$250.00
2	250.00	3.75	$250.00	$503.75
3	503.75	7.56	$250.00	$761.31
4	761.31	11.42	$250.00	$1,022.73
5	1022.73	15.34	$250.00	$1,288.07
6	1288.07	19.32	$250.00	$1,557.39
7	1557.39	23.36	$250.00	$1,830.75

a) How much is deposited each time?

b) How much interest is earned after the last payment?

c) What is the interest as a percentage of the actual investment?

2. Emily's mom pays into an RESP to save money for Emily's education. She deposits her monthly child tax credit of $75.32 into an account that gets 3.6% interest compounded monthly. If she leaves the money in for 18 years, how much will be in the account when she starts school?

3. Given the amortization information for a car loan, answer the following questions.

Loan Repayment Schedule

Principal borrowed	$25,000.00
Annual interest rate	4.20%
Compounding periods per year	12
Number of payments	48
Monthly payments	$566.72

Payment number	Payment	Interest paid	Principal paid	
0				25000
1	$566.72	$87.50	$479.22	$24,520.78
2	$566.72	$85.82	$480.90	$24,039.88
3	$566.72	$84.14	$482.58	$23,557.30

a) How much is the car?

b) How many years does the repayment of the loan take?

c) What is the interest rate per compounding period?

d) What is the total amount paid over the 48 payments?

e) What percentage of the first payment is interest?

f) After one year, $938.00 in interest is paid. What is the percentage of interest from the total payments?

4. Given the following amortization table, answer the following questions.

0				1500
1	$86.13	$5.25	$80.88	$1,419.12
2	$86.13	$4.97	$81.16	$1,337.96
3	$86.13	$4.68	$81.45	$1,256.51
4	$86.13	$4.40	$81.73	$1,174.78
5	$86.13	$4.11	$82.02	$1,092.76
6	$86.13	$3.82	$82.31	$1,010.45
7	$86.13	$3.54	$82.59	$927.86
8	$86.13	$3.25	$82.88	$844.98
9	$86.13	$2.96	$83.17	$761.81
10	$86.13	$2.67	$83.46	$678.35
11	$86.13	$2.37	$83.76	$594.59
12	$86.13	$2.08	$84.05	$510.54
13	$86.13	$1.79	$84.34	$426.20
14	$86.13	$1.49	$84.64	$341.56
15	$86.13	$1.20	$84.93	$256.63
16	$86.13	$0.90	$85.23	$171.40
17	$86.13	$0.60	$85.53	$85.87
18	$86.13	$0.30	$85.83	$0.04

a) How much money is borrowed?

b) What is the monthly payment?

c) How long does it take to repay the loan?

d) What is the interest rate per compounding period?

e) How much of payment 1 is interest?

f) How much of the last payment is interest?

5. Malcolm borrowed $5000. He makes a payment every six months on the loan that charges 5% per year compounding monthly. Complete the table.

Payment #	Payment	Interest Paid	Principal Paid	New Balance
				5000.00
1	288.90			
2				
3				
4				
5				
6				

6. Cindy is saving to buy a new pair of runners. She is putting $25 away every week in a savings account that earns 5.4% compounded weekly. Complete the chart. How much can she afford at the end of 6 weeks?

Payment #	Payment	Interest Gained	New Balance
			25.00
1	25.00		
2			
3			
4			
5			
6			

7. Bryce borrows $8000 for a new truck at 12% compounded monthly. He will repay the loan by making monthly payments of $177.96 for the next 3 years. Calculate the missing portions of the amortization table below for payments 5 and 9.

Payment number	Payment	Interest paid	Principal paid	Amount Owing
				8000
1	$265.71	$80.00	$185.71	$7,814.29
2	$265.71	$78.14	$187.57	$7,626.72
3	$265.71	$76.27	$189.44	$7,437.28
4	$265.71	$74.37	$191.34	$7,245.94
5	**$265.71**			
6	$265.71	$70.53	$195.18	$6,857.51
7	$265.71	$68.58	$197.13	$6,660.38
8	$265.71	$66.60	$199.11	$6,461.27
9	**$265.71**			

8. If Carla borrow $1500 at 6% interest compounded daily, calculate the total of her daily payments after 5 days. Use the chart provided to help organize your answers.