WS07.01 Applications of Sequences and Series

Task 1 Investigating Compound Interest

1. If each block represents €10, shade in €100.

2. Then, using another colour, add 20% to the original shaded area.

3. Finally, using a third colour, add 20% of the entire shaded area.

4. What is the value of the second shaded area? _____

5. What is the value of the third shaded area? _____

6. Why do they not have the same amount? _____

7. Complete the following table and investigate the patterns which appear.

Days (Time Elapsed)	**Amount**	**Increase by %**	**Total decimal**	**Pattern/Total Amount of money received per day**
0		0		100
	€120.00	20%	1.2	100×1.2
				$100 \times 1.2 \times$

8. Can you find a way of getting the value for day 10 without having to do the table to day 10?

9. Use your whiteboard to graph amount against time. Is the relationship linear?

Task 2 Reducing Balance

David and Michael are going on the school tour this year. They are each taking out a loan of €600, which they hope to pay off over the next year. Their bank is charging a monthly interest rate of 1.5% on loans.

David says that with his part-time work at present he will be able to pay €100 for the first 4 months but will only be able to pay off €60 a month after that.

Michael says that he can only afford to pay €60 for the first 4 months and then €100 after that.

Michael reckons that they are both paying the same amount for the loan. Why?

Note: This problem is posed based on the following criteria:
(a) A loan is taken out
(b) after 1 month interest is added on
(c) the person then makes his/her monthly repayment.
This process is then repeated until the loan is fully paid off.

	David			Michael		
Time	**Monthly Total**	**Interest**	**Payment**	**Monthly Total**	**Interest**	**Payment**
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

1. What do David and Michael have in common at the beginning of the loan period?

_____

2. Calculate the first 3 months transactions for each. (How much, in total, had they each paid back after 3 months?) David _____ Michael _____.

3. What is the total interest paid by each? David _____ Michael _____.

4. Based on your answers to the first 3 questions, when would you recommend making the higher payments and why?

_____

5. Is Michael's assumption that they will eventually pay back the same amount valid?

_____

6. Using your whiteboard, plot the amount of interest added each month to both David's and Michael's account.

7. Looking at the graph, who will pay the most interest overall?

_____

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