Junior Cycle Mathematics - First Year

Investigation "Saving Money"

Learning outcomes in focus

Students should be able to:

- U.3. recognise that equality is a relationship in which two mathematical expressions have the same value
- U.4 represent a mathematical situation in a variety of different ways, including: **numerically,** algebraically, **graphically**, physically, **in words;** and to interpret, analyse, and compare such representations
- U.11 generate general mathematical statements or conjectures based on specific instances
- N.4 analyse numerical patterns in different ways, including making out tables and graphs, and continue such patterns
- GT.5 b. draw graphs of line segments and interpret such graphs in context, including discussing the rate of change (slope) and the y intercept
- AF.1 investigate patterns and relationships (linear, quadratic, doubling and tripling) in number, spatial patterns and real-world phenomena involving change so that they can:

    a. represent these patterns and relationships in tables and graphs

    b. generate a generalised expression for **linear** and quadratic patterns in **words** and algebraic expressions and fluently convert between each representation

    c. **categorise patterns as linear,** non-linear, quadratic, and exponential (doubling and tripling) using their defining characteristics as they appear in the different representations

Learning Intentions

We are learning to:

- design, plan and conduct an investigation
- use different representations including a table and a graph to show a pattern
- generalise expressions using words

Teaching and learning context

1st year students were asked the question “Padraic has €10 in a money box. Every week he saves €4. How much money does he have after 5 weeks?” Prior learning includes - recognising that multiplication is repeated addition, plotting points on a coordinate plane, representing a pattern in a table and looking at the differences, categorise a pattern as linear through looking at the differences.

Task

“Padraic has €10 in a money box. Every week he saves €4. How much money does he have after 5 weeks?”

Challenge question “How much has he saved after 30 weeks?”

Success Criteria

I can:

SC1: Represent the pattern in a table

SC2: Draw horizontal and vertical axes with titles and scales

SC2: Represent the pattern as a graph

SC3: Demonstrate that repeated addition is the same as multiplication

SC4: Describe the pattern using words

SC5: Recognise what stays the same and what changes

SC7: Identify (or describe) something similar between the table and the graph

SC8: Come up with a rule in my own words that would allow me to work out how much money Padraic would have after 30 weeks.

Padraic has €8 in a money box. Every week he saves €5.

Week	**Amount of money in money box**
Start	€8
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Describe any patterns you see:

_____

_____

What stays the same?

_____

_____

What changes ?

_____

_____

How much does he have after 5 weeks?

_____

_____

How much does he have after 10 weeks?

_____

_____

How much does he have after 20 weeks?

_____

_____

Can you describe what is happening in your own words? Can you come up with a rule?

_____

_____

Using your ‘rule’, work out how much money he has after 10 weeks. Compare this to your table.

_____

_____

Using your ‘rule’, work out how much money he has after 20 weeks. Compare this to the answer you got before.

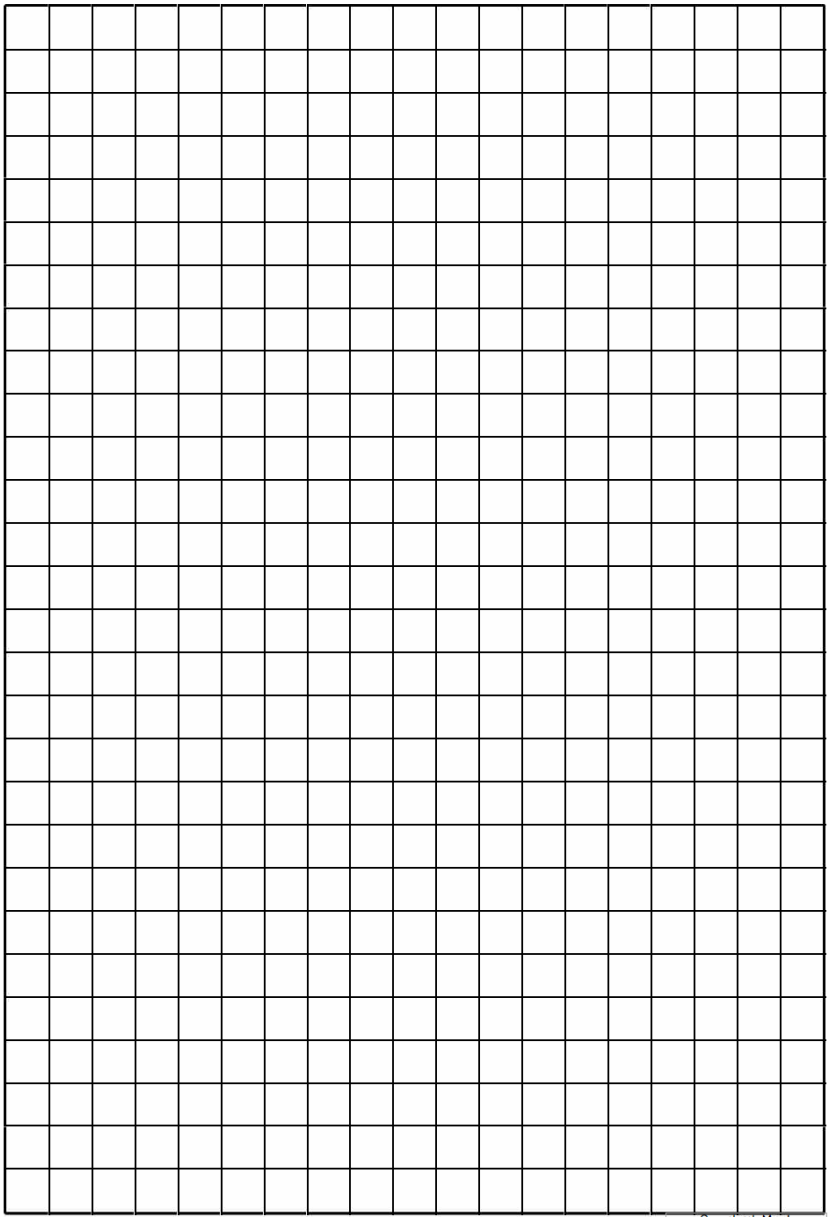
_____

_____

Using your ‘rule’, work out how much money he has after 30 weeks.

_____

_____



Describe anything you notice about your graph:

_____

_____

Describe anything that the table and the graph have in common:

_____

_____