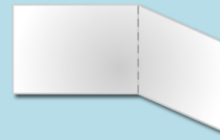


Iteration By Paper Folding



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INTRODUCTION

I have used this idea over very many years. What I particularly like is the way we can carry out an iteration in a practical, hands-on way... then explore why it works and what the algebra looks like.

MATHEMATICAL CONTENT

- Fraction walls as number lines
- Iteration
- Algebra

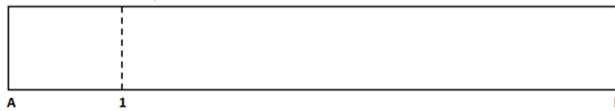
APPLICABILITY

KS2 – KS5

For this iteration, apart from the initial fold, we are only allowed to fold in half.

Step Take a strip of paper.

- 1 Mark the left hand end as A and the right hand end as B
Make a fold quite close to end A and label this as fold 1



Step I ask the class to pretend the fold line 1 is one third of the length of the whole strip, even though this is clearly not true.

2 However, if it were to be true it would mean the distance from 1 to B would be two thirds and if we fold this distance in half, we will produce a new (and more accurate length) of one third.



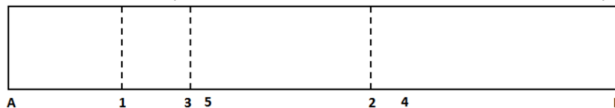
Step As before, if the distance from B to 2 is one third, then the distance from 2 to A must be two thirds and again by folding this in half we will create an even more accurate value for one third.

- 3



Step By repeating this process we will produce some as follows where line 3 is halfway between A and 2, line 4 is halfway between B and 3 and line 5 is halfway between A and 4.

- 4



Q1 By continuing this process for a further few folds we iterate to one third; the iterative function is $x \rightarrow \frac{1}{2}(1 - x)$
How can we use a similar method to arrive at one fifth, or one seventh or...?